October 1989 Vol. 3 Nº 1 Price £1.80

Archive

The Subscription Magazine for Archimedes Users

ARM 3 Revealed

PC Show Report

Introduction to 'C' Programming

Oak Computers SCSI Drives / Armadillo Sampler

Games Writing Techniques / Pipedream Column

Reviews: A4 Forms Manager, Chromalock, Plane Draft, Arcade 3, Ibix the Viking, Avon, RISC-OS P.R.M., Euclid & Mogul, Spark File Compressor, HiTec EC2400 modem.

STOP PRESS!

Sorry that this issue is (again!) a little late but Adrian Look went down to the PC Show and reported that there was so much new stuff there for the Archimedes that it was worth holding up the magazine and not sending it to the printers until he had had a chance to recover his breath and write at least a brief PC Show Report. He wrote the report and we found that it would just fit in the space that had been occupied by the Timewatch review (apologies to Chris Furlong – we'll fit your review in next month).

The report only gives the extra product news which is, if you like, the urgent part of what Adrian found, but there was also a lot of technical information that he gathered and this we will try to fit in next month. If you went to the PC Show yourself and picked up other information about Archimedes products, do let us know. Adrian reckoned he could have done with another full day there.

I wish I had done it sooner...

There are two things I have done recently that I wish now I had done sooner. The first is to buy a fax machine which I have found is extremely useful. I don't know how I managed without one. The second thing is to set up a readers' survey. The results have been absolutely fascinating. Thanks for all the trouble that many of you took to give us so many detailed comments about ways you think Archive could be improved. I have said more about this (and about how the fax could help some of you) in my Ed's Comments column.

"No religion, please, we're British!"

One comment which has been made (again!) is that one or two of you don't like me making comments about the Christian faith. I'm sorry if that has genuinely caused any offence, but I have a dilemma. This is illustrated by something written by an aetheist which (roughly) said that if he actually believed the claims that the bible makes he would feel obliged to use every effort and take every opportunity to present those claims to other people. That really sums up my position. Whilst I have no desire to upset anyone, I do believe that the claims that Jesus makes are so important that I try to suggest that people should at least read for themselves what Jesus said and come to their own conclusion. Surely, you couldn't call that "ramming religion down people's throats" could you?

My belief in Jesus is part of what makes me who I am, so it's bound to spill over into all I do – I hope that doesn't cause too much offence. Also, I hope you feel that we give you a good service (no pun intended!) as that is part of what it means to me to be a Christian.

Thanks for buying and reading Archive despite me!

Archive

Volume 3 • Nº 1 • October 1989

Contents

Archive magazine is edited by Paul Beverley and published by Norwich Computer Services.

Products Available

• **ABC Extras Package** – for use with version 2 of the ABC compiler, provides a cross-referencer, a library maker and a profiler and trace package. £49.95 from Dabs Press or £45 through Archive.

• **Accounts & Invoices** – Two programs that have been available for some time, but only just come to light are Apricote Studios' two packages, The Account Book £27.95 and The Invoice Program £27.95 (buy them together for £49.95). These programs offer purchase and sales, VAT and trial balances etc and invoicing and statements for up to 700 customers with 100 stock presets.

• **Archway up in price** – Archway (RISC-OS version) from Simtron has now gone up in price to £99.95 (Archive price £85)

• **Arcol** – Multi-User 256 colour Art Package from TAP Consortium £50 + VAT for single user or £250 + VAT for a site licence. Yes, another art package, but from what I saw of it at the Econet Conference, it looks impressive. It is configurable to whatever system you want to use including being fully networkable and it has some interesting features designed for people who are concerned with real applications of an art package rather than just using it to draw pretty pictures. This is born out by the inclusion of such features as the ability to produce colour separations.

• **ArcTrivia** £24.95 (£23 through Archive) is now available in a new version with 7,000 questions. Registered users may get an upgrade free of charge by returning their old disc plus a blank disc to Moray Micro Computing.

• **Careware 4** (£6 but remember that **all** the £6 goes to charity now, not half of it as before – see Comments on page 14) contains an excellent animation produced on Euclid/Mogul by Malcolm Banthorpe, a serial link to BBC micro, !BIN – an application to allow you to drag files onto the icon bar for deletion, !PCdir – a desktop application which converts files to and from MS-DOS, 3D adventure game, screen blanking routine, WP file conversion routines, function key strip printer and some more tunes for use with Maestro.

• **Shareware 15**, available now, contains lots of bits and pieces: 16 graphics demos, two !Draw fonts, six !Maestro tunes, 17 sampled voices and improvements for using View.

• **Shareware 16**, available now, contains (another) 256-colour art package, link to Psion organiser and the latest version of the YAIG game which works in the overscan mode giving much greater screen area in which to play.

• **Central Heating Calculator** – D.J.Holden has produced a commercial version of his central heating calculator program that appears on the Shareware 12 disc. It has several extra facilities and bug fixes. For further details he can be contacted at 29 Knighton Park Road, Sydenham, London, SE26 5RN. (01–778–2659)

• **Genlock for the A3000** – Wild Vision now have a genlock card available for the A3000 for just £199 plus VAT. It is a mini podule that fits inside the A3000.

• **Caption Generator** – Chromatext is a flexible caption generator from Wild Vision allowing 35 screens of video titles in various colours, fonts and sizes to be stored for overlaying on video as and when required.

• **LC-10 Typefaces** – Ian Copestake Software have created a brand new collection of typefaces for the LC10 printer – 7 typefaces are available, £9.90 each (inc VAT etc) or £24 for three (and introductory offer) or all seven for £44. Specify computer, wordprocessor and disc format when ordering. (N.B. These are not the outline fonts for Acorn DTP that Ian is planning to offer later in the year.)

• **Micro-Trader**, the integrated accounts package for small businesses from Meadow Computers is now RISC-OS compatible and has a whole host of new and improved features still at £200 + VAT including telephone support service.

• **New Noah Paint** – Noah Paint (as reviewed in Archive 2.11 p 56) from GMA Hamburg, has been

updated and has had a new manual written for it and will now be known as Noah Professional Paint. The Noah Paint 16 has been released at only £10 + VAT.

• **Noah Tools #1** for just £10 + VAT from GMA Hamburg has !FastROM to speed up the MEMC, !ReBoot to call a hard reset, !WatchDog to give BASIC editor access from desktop, a trashcan (a bin in UK terminology), mouse controls via the keyboard, accessing filetypes, !Shell is a brand new CLI gives CLI history and editing etc, IFF Loader to load IFF pictures, BigScreen to emulate a 20" monitor on a multisync (= an overscan mode?), and finally a VT100 emulation. (Look out for Noah Tools #2, also £10, which is on the way, said to have a "Reassembler" (disassembler?), NoahTree = Disctree, Filefinder like grep in Unix, RISC-OS changer which changes normal BASIC programs into applications and possibly a multiple copy program. Also in the pipeline are Noah Games# which will be £15 each, the first of which will be a version of "tetris".)

• **Pipedream Extended Dictionary** £6.95 from HJH Software (Archive £6.50) provides 156k of user dictionary that includes most words that you will require even in quite highbrow documents.

• **Programmers' Reference Manuals** – The new P.R.M.'s are here! Four volumes plus a separate index for just £79.95. There is a rumour of an upgrade for owners of the old manuals – £55 plus the two front covers of the old PRM, but I can't get anyone to confirm or deny the rumour. The Archive price is £75 – not as much discount as usual because this price includes carriage and the manuals are extremely heavy.

• **RISC-OS Mogul** for RISC-OS Euclid – £20 inc VAT from Ace Computing (£18 through Archive). See Malcolm Banthorpe's review on page 50 for more details.

• **Transputer Add-ons** for Archimedes – Gnome Computers Ltd have developed a new programming environment for use on the Archimedes based on the Inmos Transputer Development System (TDS). The hardware is based around three plug-in boards: a Link Adaptor (£200) allowing communication with an external transputer system at 10 or 20 MHz, a TRAM Motherboard (£250) which provides similar facilities but also houses up to 4 TRAMs which allows Archimedes to act as a stand-alone TDS, and the Transputer Baseboard which houses a T4 or T8 transputer and 1 to 8 Mbytes. (Boards with 2 Mbytes of RAM and a 20 Mhz T425 or T800 are £875 and £995 respectively.) The software consists of a Server Program (£200) which, with the Archimedes high speed screen and disc handling, gives an overall performance of 2 to 3 times that of a mid-range PC. It can also support versions of C, Fortran and Pascal compilers (£750 each).

• **WordPower now PD** – Ian Copestake Software have now made WordPower, the well-established wordprocessor that started life on the BBC Micro, a PD program available for just £5. It is a full working version that works on the Archimedes and is complete with documentation.

Review Software Received...

Apart from reviews already written we have received review copies of the following software: I currently have "The Account Book" + "The Invoice Program", "Keyword" (Archive 2.12.2), Noah Tools #1, Fax*File Manager (prints personal organiser pages) and a Study Guide for First Word Plus. Also, a demonstration version of Micro-Trader, so perhaps someone would like to do a comparison between that and A/c Book + Invoice Program. A

Credit where due

• **Clares** get a bouquet for their policy on upgrading Artisan to RISC-OS. At first they told us that we would all have to pay for the upgrade but then they relented and sent a disc of the corrections to me free of charge and told me to copy it freely to any I knew in N.Z. who had Artisan. John Dagg, Masterton, N.Zealand.

• **E.C.S.** Kings Lynn – Gave excellent service over various aspects of the Archimedes and peripherals. John Charman. A

Forthcoming Products

• **All-In Boxing** from Dabs Press £14.95. Try to knock out your opponent (or knock out the computer!) with digitised grunts and groans and bells!

• **Arc-PCB Professional**, £375 (inc VAT) from Silicon Vision goes on beyond the existing Arc-PCB and it will offer a faster and improved router, oval pads, pull down menus, clear pad holes for hand drilling, faster re-draw, extended library part manipulation, 24 and 9-pin printer support, component pulling and instant editing operations etc, etc.

• **Folio on Archimedes** – Primary teachers will no doubt be familiar with Folio, a structured writing environment to help pupils use language creatively. It has been used for a long time on BBC Micros. Now it is being developed to make use of the WIMP environment and many extra features are being added. Presently it is on trial on schools as part of the development procedure and will be generally available in good time for use in the next academic year.

• **Knowledge Organiser** from Clares is a RISC-OS updated and improved version of ArcTFS (see Archive 1.2.48 and 2.2.21). Should be available in October price. If you want to talk to the author about it, he is Sean O'Connaill and he logs onto SID almost every day, so you can contact him there. If you don't have a modem, send your queries to us and we will forward them.

• **Pipedream 3** special characters – If anyone wants any special character sets for use with PipeDream 3 contact Ian Copestake Software.

• **RAM upgrades** for A300 and A3000. Protokote Ltd are soon to be releasing ram upgrades for the A300 series and are also working on upgrades for the A3000.

• **Ray-Tracing Package** – SolidsRender, £79.95 (inc VAT) from Silicon Vision produces 'photo-realistic' images of 3D scenes which take into account light sources, reflections, shadows, transparencies, refractions and textures.

• **Robo-LOGO** – £69.96 inc VAT for Silicon Vision is a version of the well known LOGO language applied to the movement of a 3D articulated humanoid or animal figure. The graphical figure responds to commands such as walk, turn, bow, pick etc.

• **Various new products** from Much Technology...

• **ARCHie Andrews** – Speech synthesiser. Commands include *THROW (place) to specify where the voice should come from, and *DRINK (amount) allows you to drink a glass of water (an amount from 1 to 255 pints) whilst programming the alphabet. (Comments from reviews: 'Grilliant' – GeeGug, 'Axolutely Anazing' – Krestel.)

• **RISCy Business** – A dual processing accounts package which can be used to produce two sets of accounts from one set of figures, the first is held in shadow memory and, rather than being printed out, is stored as a relocatable module known as Switzerland and the second is produced in 'real time' (honest, guv!) and printed out on very pure white paper in a sincere font. ('Highly recommended, John' – Sporting Life.)

• **ARCHer** – The Popular Writer's Word-processor. This is entered by typing *HACK and gives on-screen TRYSITON (The Rubbish You See Is Tired Old Nonsense). There are absolutely no highlights. It provides a built-in checker, *TACKY, which can weed out and destroy good literature at 3,000 words per minute and *PLAGIARISE, a not very selective copying routine.

Also available "next week" are... •**ARMband** – The Music Processor, •**ARMiga** – A Rude Word, •**ARMpit** – The Database, •**ARC-hives** – The Beekeeper's Database, •**ARCtic** – Real Time Polar Clock and •**RISCque** – Spanish Language Tutor.

(Thanks to Colin Thompson for finding these new products. Some software houses are rather bad at sending out information to publicise their wares, so if any other readers have heard of forthcoming products that have not had a mention in Archive, do let us know. Ed.) A

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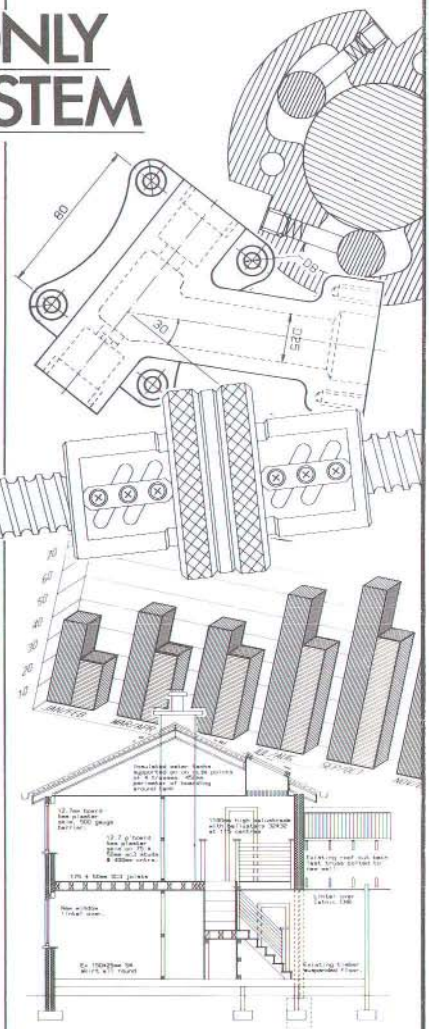

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Hints & Tips

• **Acorn DTP fonts and print outs** – P.J.Burn says that in order to print out Acorn DTP documents on an A310 you should select mode 11 as this releases 40k of memory. He also says that in order to increase the speed of the DTP screen update you should ensure that the font cache is 24k or larger.

• **Acorn DTP double spacing** – Some readers have complained that when starting a new paragraph the Acorn DTP will always produce a double space. This can be solved by altering the space above setting of the paragraph's style.

• **BASIC listings for !Edit** – Mark Taylor says that it is easy to create an ASCII copy of a BASIC program. Just install !Edit in the normal way and then create a task window (this can be done by clicking the MENU button on the !Edit icon and selecting the 'New task window' item from the 'Create' sub-menu). In this window start BASIC by typing *BASIC, then just LOAD the required program and LIST it. You can now save the contents of the window as a normal ASCII file.

• **C operating system calls** (issue 2.12 p 36 cont) – Ray Loades-Bannon says that to access OSCLI commands from C you should use either:

```
system ("screensave <pathname>"")
or:
{
    char *cptr;
    strcpy (cptr,"screensave ");
    strcat(cptr,pathnameptr);
    system(cptr);
}
```

See the 'Calling other programs from C' chapter in the C manual for further details.

• **Debugger BreakPoints** – When stepping though code, it is useful to run the code up to a breakpoint, and then remove the breakpoint and reposition it further ahead. Here are three function keys definitions suggested by Robin Terry to help you do this:

```
*Key1 "BreakClr PC|MBreakSet "
*Key2 "Continue|M"
*Key3 "MemoryI PC|M"
```

The first breakpoint is set by using *BreakSet, but subsequent breakpoints can be set by pressing <f1> and typing in the address. Then press <f2> should be pressed to execute the code , and <f3> should be pressed to look at where you've got to.

• **Droom under RISC-OS** – A.H.Eagle says that when using Droom under RISC-OS the $.Data.Map program just caused the computer to freeze at line 820. This line reads 820 ?&CFF=L, and doesn't seem to serve any purpose (perhaps it is a hang-over from the BBC version). He removed this line and the program now seems to work OK (... so far!).

• **Econet and the Desktop** – A warning to all people using the desktop on the network: *commands are truncated to about 80 characters by the NetFiler, so for example, if you are several directories down and you rename a file, it could be renamed to something that you didn't quite expect. More dangerous is the *Delete, in that you could want to *delete net#254:<pathname>.FredOld but your good copy is deleted when the command is truncated to *delete net#254:<pathname>.Fred. Truncation occurs due to the Acorn fileservers only being able to cope with data packets of around 80 characters (although the SJ Research fileserver can handle packets up to 128 characters). Another interesting feature is that if the *command is over 128 characters, no truncation occurs and a Net error is generated.

• **Filer_OpenDir** revisited (issue 2.12 p 6 cont) – A simpler way of using system variables with the *Filer_OpenDir command has been suggested by one of the Archive BBS callers:

```
*Set Alias$temp Filer_OpenDir
    <system variable>|MUnset
    Alias$temp|M
*temp
```

This sets up a system variable, called Alias$temp, which is used to expand the system variable and then delete itself once called.

• **Hard Disc Backup program** on Careware 3 – Terry Bromilow says: "The program was originally written to run under Arthur OS using the D or L format discs. I put a new front end on it to make an application for RISC-OS and put in some lines to accommodate E format discs. It is now evident that the latter did not get tested.

The BASIC program !Hdb_v200 in the !HDBackup directory should be amended as follows:-

Interchange the adjacent lines 2140 and 2150 and put a new line between them: 2141 *DISMOUNT

• **Hard disc parking** (2.11 p 13 cont) – Martyn Lovell says that although *bye from a non-adfs filing system won't park an adfs hard disc *adfs:bye will (SCSI hard drive owners should use *scsi:bye).

• **Keyboard condensation** – One reader has noted that there is no lacquer on the top surface of the keyboard PCB. It is not unusual for people to blow dust, etc away from the keyboard, however, this will cause condensation onto the PCB and cause some minor corrosion. This can easily be wiped away.

• **Limited ADFS memory error** – The ADFS module will remember the catalogues of any discs it sees (e.g. those that it *mounts). However, it is limited to the amount of memory it can allocate to 'remembering' these catalogues. This is governed by the *Configure ADFSDirCache command. When the ADFS directory cache is full, the oldest catalogues should be discarded as new ones are encountered. Unfortunately, the module has a bug, which prevents it from doing this properly. What makes this bug so serious is that it can cause the dreaded 'Filecore in use' error, which cannot be rectified, thereby making it impossible for you to save any data, etc that you might have been working on. *(If Phil Colmer at Acorn, or whoever, could give us a clue on this one, that would be useful. Ed.)*

• **Naming discs** – You may already realise that you should not give discs the same name (using the *NameDisc command) as RISC-OS will only access one of the discs i.e. the one most recently *MOUNTed. David Leckie found that this also holds up for fileservers discs. He had two separate fileservers 254 and 245 both with hard disks called FS, as you can imagine this cause much confusion!

• **Obey module bug** – "Speak and I shall obey ... or maybe not." There is a bug in the obey module supplied in the ROMS (v0.07). If an environment variable is set to a string ending with the tilde character (~) then the string will magically acquire a few extra characters, or worse.

Using Edit, create a new obey file containing the command:

```
Set testvariable abcdef~
```

or similar, ensuring that the <return> key is pressed immediately after the tilde (~). Save the file to a directory window and then double click on the file icon to run the file. This will create the variable "testvariable". Press <f12> to get a system prompt and type

```
Show testvariable
```

to display the variable's value. It will show something like

```
testvariable : abcdef~~&'
```

i.e. it has acquired a few extra characters. (N.B. I've been unable to repeat (see below) this so the characters may be wrong – but I do know where they originate from so this is an educated guess)

Worse is that depending on the exact situation when the file is run an "Abort on Data Transfer" error may occur (!!) and the variable will not have been created.

The problem is easily solved – don't try and create a string ending with ~ in an obey file. If necessary a space can be placed after the tilde (~) and this will be enough to prevent the error. Clifford Hoggarth

• **RAM disc size** – To read the size of a RAM disc, not *configured but set from within the desktop task manager you should use:

```
SYS "OS_ReadRAMFsLimits" TO A,B
```

(B-A)/1024 gives the size of the the RAM disc in kbytes.

To check if a *configured ram disc exists then try:

```
SYS "OS_Byte",161,144 To
    ,,ramdiscsize%
```

The variable ramdiscsize% indicates the number of RAM pages to be allocated to the RAM disc e.g. 8k blocks for a 300 series.

• **Recursive directory copying** – If you copy a directory into itself (as Clive Payne did with his library directory in issue 2.11 p 15) the computer will get into an infinite loop of copying directories inside of themselves. To stop the computer from using all your disc space up, you can press the escape key. The error can then be rectified by going into the parent directory and deleting its children i.e. you don't have to reformat your disc!

• **ROM Speed Up** – In several Archive issues (e.g. issue 2.11 p 8) we have pointed out that the speed at which the Archimedes runs its ROMs can be increased. Martyn Lovell advises us that this can cause RISC-OS to crash and so is not very reliable.

• **Squish** – I am very pleased with Mike Harrison's "SQUISH" program (on Careware disc 2). It enables me to write meaningful, well laid out programs and then to gain processing speed following compression. Brilliant!

I have, however, discovered a bug. This occurs whenever you use a statement such as:

```
IF a=b c=d
```

What actually happens is that it compresses to:

```
IF a=bc=d
```

The program then fails "Unknown or missing variable". To circumvent this, the full construct IF ... THEN ... should be used. B.R.Wilson, Solihull

• **Uncluttering catalogues** (2.11 p 13 cont) – If you close down an application using the ADJUST button the filer will (re)open the viewer containing the file you last accessed.

• **Using Sys$DateFormat** (issue 2.12 p 19 cont) – Mark Taylor (along with several others) has answered a question which appeared in last month's Help!!! column.

The system variable Sys$DateFormat is only used by the SWI call OS_ConvertStandardDate AndTime and not by the BASIC pseudo variable TIME$ (see pp 400-402 of the old PRM for further details).

```
10 REM >$.Convert
20 REM a program to convert TIME &
             DATE in to a string,
30 REM in the format of the system
        variable Sys$DateFormat
40 :
50 REM some workspace for the time
                & date SYS call
60 DIM block% 100
70 :
80 *Set Sys$DateFormat
             %yr%mn%dy%24%mi%se
90 string$=FNtime_date
100 PRINT "The time is
      (YYMMDDHHMMSS) = ";string$
110 END
120 :
130 DEFFNtime_date
140 REM first get 5 byte time code
150 REM using OS_Word &0E,3
160 SYS "OS_Word",&0E,3 TO r0,r1
170 :
180 REM get date & time string
190 SYS "OS_ConvertStandardDate
    AndTime",block%,block%+50,49
                    TO r0,r1,r2
200 :
210 REM extract string from data
                          block
220 date$=""
230 FOR x%=0 TO (12-r2)
240 data$+=CHR$(r0?x%)
250 NEXT x%
260 =date$
```

• **VIDC warning** – Someone (Philip Green, I think) sent in a warning to say that you should NEVER connect and disconnect video and monitor connections with the computer switched on for fear of damaging the VIDC.

I have been doing just that for two years now on several different Archimedes computers and have NEVER had any problems, so I wasn't going to bother printing the warning – it seemed a little over cautious. This morning I connected up a brand new monitor, live as usual, and got a funny picture. "Drat", says I, "It's a DOA and will have to go back

to the distributor from whence it came!" However, further fiddling and switching of monitors (live) between computers revealed that the computer was at fault – there were funny dark vertical lines down the display and the sound was a bit croaky (sound comes through VIDC). This is what you call learning the hard way or "Pride comes before a fall" or something. Anyway, don't say we didn't warn you! Ed.

• **Hints & Tips printing error**, Archive 2.12 p 7. The IF statement at line 750 is incorrect – a 7 has been cut off by the editor – 'key% < 5' should read 'key% <57'. A

First Word Plus Column

Stuart Bell

Since my opening remarks last month, letters have been coming in pretty frequently. Here they are – please do write if you can shed light on any of the queries which follow:

John Charman has posed two problems. The first is how to send escape codes to the printer from within FWP, to obtain, for example, large print or variable line spacing. To send <ESC> as part of a single character's code or part of a command sequence, you need to produce a customised FWP printer driver for your particular printer. Whilst Appendix B in the manual describes the process, Ian Nicholls' article 'ASCII, Printer Drivers and First Word Plus' in Archive 2.2 is strongly recommended as a more understandable explanation. I seem to remember that my greatest problem was working out in which directory the renamed configuration file ('1WP_Print') has to be saved for FWP to find it and use it instead of the default printer driver. The answer is as 'FWP.Resources.1wp.1WP_Print', assuming that your FWP working disc (or root directory) is called FWP.

John's second question is how you can search for carriage returns or tabs using the find and replace facility. I don't think you can – or can someone prove me wrong?

Tom Lakofski has a problem editing FWP palettes under RISC-OS, in that they get horribly corrupted. Since I use a monochrome monitor and a daisy-wheel printer, both salvaged from earlier systems, I have no experience of palettes or colour. Can anyone help, please? A RISC-OS Hint on Archive 2.8.12 seems relevant – confirming a change of palette file format between Arthur and RISC-OS, noting that FWP assumes the old format, and that there is a palette convertor program on Shareware disc 9.

R A Hemmings writes to say that although the FWP manual says on page 218 that you must use your printer's DIP switches to disable automatic perforation skip and automatic line feed after carriage return, he has found that the switches can be left enabled, thus giving compatibility when the printer is used on his Master 128. They are then over-ridden by software. He has modified three lines of the driver on Shareware Disc 6 for his Canon PW1080A dot matrix printer thus:

1, D {code for LF removed}

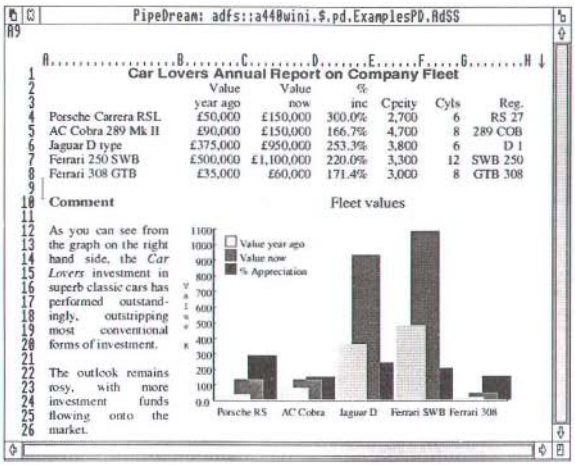
1F, 1B, 40, 1B, 4F {Disable perforation skip added to reset code}

23, 1B, 6A, 37, D {Reverse feed paper by one line before a graphics carriage return}

Acorn responded to my praise of the '1st Mail Window Problem' solution by warning that GST believe that the template file poke that was printed in Archive 2.11.12 may cause problems. The excellent news is that they have put an approved bug-fix on SID, Acorn's own Bulletin Board, and given approval for it to be made available on Archive BBS. Any dealer may also down-load it for their customers. Perhaps Paul could also put it on this month's Program Disc? Please do not send your FWP discs to Acorn's Customer Services Department for updating. Thanks to Acorn for such a prompt response.

Finally, a personal request for anyone who has written a full printer driver for the Tandy DWPIIB (a badge-engineered Ricoh 1600 DWP). Its micro-spacing technique is wierd and I've never got micro-spacing working properly under FWP. Has anyone else tried it, please? A

PIPEDREAM 3



PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. You can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

Based on PipeDream 2, the best-selling integrated package for the Archimedes, PipeDream 3 has been completely re-written to take full advantage of RISC OS - if you can use RISC OS, you can use PipeDream 3. It is fully multi-tasking and multi-windowing, so you can work on many documents at once and instantly move information between them. And since PipeDream 3 can automatically load and save most popular file formats, including VIEW and First Word Plus, switching to it from other programs has never been easier.

Power, flexibility, speed, ease of use. PipeDream 3. Breaking down the barriers.

For a free brochure, see your Archimedes dealer, or phone us on 0954 211472 or return the coupon.

PipeDream 3 is for all Archimedes computers with RISC OS and 1Mbyte of RAM.

PipeDream 3 costs £147.00 +VAT.

Major features include:

- many documents loaded at once
- intuitive RISC OS user interface
- displaying and printing of pictures within text
- built-in 93,003 word spelling checker
- file compatibility with PC & Z88 PipeDream and BBC View Professional
- background recalculation
- keystroke compatibility with Z88 & PC PipeDream
- Z88 filing system
- automatic loading of VIEW, ViewSheet, Lotus, First Word Plus, Tab and CSV files
- automatic saving of VIEW, Lotus, Acorn DTP format, Tab and CSV files
- multi-field sorting
- use of all available fonts
- 62 spreadsheet functions
- external references for 3-D modelling
- macro file recorder
- slot protection

For a free brochure, complete and return this coupon
PipeDream 3 ☐ View Professional ☐
Name _____
Address _____
_____
_____
_____ Post code _____

Colton Software, Broadway House,149-151 St. Neots Road, Hardwick, Cambridge CB3 7QJ, England.
Fax: 0954 211607 Tel: 0954 211472

All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge, CB3 7QJ, England.

Fax. 0954 211607 Tel. 0954 211472

Readers' Comments

• **Acorn DTP** – I have used Aldus Pagemaker quite a lot on both the MacII and Nimbus PC so I know it quite well. Thus I am really comparing ADP with it, which is not fair as it costs 4 times as much as ADP.

I have used ADP a little on an A440 and an A310 with single drive and I have used it a lot on an A310 with a hard disc.

On an A440 it is very fast because you can configure a large fontsize, also there is a fast scroll mode and no memory problems with printer drivers.

On an A310 with one floppy it is acceptable but you are limited to about 16 pages in document size. Printing is a bind as you need wimpmode 0 to get enough memory.

On the A310 with hard disc you can set up disc slaving so that the limit on document size disappears. (Also possible but slow with two floppies). Also cacheing fonts is acceptably fast, not quite as fast as an A440 with large Fontsize but fast enough. However, finding enough memory to load a printer driver is a difficult problem.

Positive points I would make are:

1) Speed, changing the font/size on a 40 page document is fast compared with PM on MACII (which is fast compared with PM on PC).
2) Extensive clip art, etc supplied with the package. None with PM.
3) Search and replace available (none in PM?)
4) Font system is great, as good as MAC and much better than Postscript or HP system on a PC. You do not have to install screen fonts as bit images. This takes several Mbytes of hard disc space on PC and then you have to buy/download the actual font if you are using a HP type printer.

   (On PM 3.0, the font sizes are limited to whole point sizes which, for fitting articles into pages of a magazine is a bit of a pain and I'm going to pay £75+VAT for the upgrade to PM 3.5 just to get a version that does half point sizes. Ed.)
5) It is a good, robust, usable, friendly system at a reasonable price.

On the negative side:

1) No user-installable import filters. Import system only caters for ASCII or First Word Plus files. If next year a new WP for the ARC appears (Acorn have a WP/SS/DB package coming) there does not seem to be any method of adding a new import routine so text would have to come as ASCII and any format commands would be lost.
2) Will not format text round irregular shaped objects. It can only be done by fitting many frames round the object then pouring text in.
3) When producing a large document you need to create each page as you pour the text in. It would be quicker to create say 40 pages in one go.

The lack of an auto flow facility was surprisingly not a problem with a long document. David Leckie.

• **Acorn DTP** – The review of Acorn Desktop Publisher in the last issue is a bit misleading, some of the negative points not being problems at all.

1) There is **not** a limit of four paragraph styles. The four listed are provided as standard, but any number of others can be created as required (starting with a copy of an existing one). However, good typographical style suggests that no more than four styles/fonts/enhancements are used on one page, so as not to give the impression that the designer has run away with the DTP package's features. Is there a subtle hint by Acorn here?
2) Imported text (i.e. created in !Edit or FWPlus) can 'pour' across page boundaries or between two frames on the same page but I've not found a way to do this with directly typed in text.
3) Text size can be as 'minute' as required, although readability will suffer below the smallest standard size of 8 points.

Maybe Impression will address and rectify some of the other problems, although that package does have the disadvantages of being written/marketed

by Computer Concepts and probably being sold with some form of copy protection. But this review was definitely unfair to ADTP on those points. **Jonathan Marten**

P.S. I've just been looking at a DTP software poster which accompanied PCW some time ago. As well as having some good hints on page design and style, it lists some packages as "Ethos (for the Macintosh) – $5500" and "Interleaf Publisher (for the IBM) – $2495, needs 80386, 6 Meg RAM, 40 Meg disc, VGA". Who says ADP is overpriced at £149?!

• **Archway** – When someone with experience limited to programming in BASIC has acquired an Archimedes and created windows with scrolling bars and with the various icons required for the manipulation of windows which all function correctly and which are opened by various menus and sub-menus which one has also created, that someone (in this case, myself) feels rather pleased.

I would not have been able to do this without the assistance of Archway.

I thought your review of Archway was fair and well balanced but I felt that your reviewer should have shown more enthusiasm for the product.

Competent programmers may not appreciate the value of Archway but to people such as myself, it is a salvation.

It is true that Archway needs application until its methods are understood but, subsequently, it needs very little skill to use.

The next issue (free upgrade) promises many improvements and simplifications to which I look forward. **George Foot**, Oxted.

• **Bank Accounts** – Several people have over some months mentioned bank accounts programs. I have a program that runs under the PC Emulator called Money Manager and it's much better than any other financial software that I've seen. It costs £49.95 inc VAT from Connect Software Ltd, 3 Flanchford Rd, London W12 9ND. 01-743-9792 **Chris Walker**, Norwich.

• **Gerald Fitton on Memory Abusage** – Does Mr. Fitton know something about RISC_OS that I don't, because I think he was talking a load of rubbish. For a start, !Boot files are only run in !App directories. if they exist, in the case of !Lander and !Patience they do not. As far as I can see, the reason they use up memory when first catalogued in the $ directory, is because the file !Sprites is merged into the IconSprite pool which starts to gobble up your RMA.

I may be wrong, but could he please explain what is meant by a 'dormant' application not sitting on the iconbar? **Gary Atkinson**

Gerald replies: Of course Mr Atkinson is right to complain. I had not checked whether !Lander and !Patience had !Boot files. They do not. However, I do have !Patience, !Lander and other "Games" in a Games directory and if I check with the Task Manager, I do find a loss of Applications (free) memory after opening the Games directory. For my other directories, I find that I "lose" over 100k after I have opened all of them.

Let me also quote from page 3 of Acorn's Release Note which accompanies their Desk Top Publisher Version 1.02. "Users of 1Mb systems should ensure that... there are no RISC-OS applications (other than !Fonts and !System) in the hard disc root directory. This is because every new application 'seen' by the operating system consumes (and cannot subsequently release) a small amount of memory... "

Also on page 11 of Colton's PipeDream 3, they explain the trade off between using a dedicated sub directory and the root directory. In the latter case "Then, each time you switch on your computer, RISC-OS will know where to find PipeDream... this method results in extra memory being taken up by the system, leaving less for the applications."

By "dormant" the main thing I wished to convey was that by double clicking on a data file (e.g. a PipeDream data file) the application (PipeDream) would be loaded and appear on the icon bar followed by the data file being loaded into the application. The way that RISC-OS knows which application to load is through the variable "Alias$@RunType_xxx" which you can see by

typing *Show and which is set up by the application's !Boot file. **Gerald L Fitton**

• **Pipedream 3** – I have been using PipeDream 3 over the last fortnight and found that the User Dictionary would freeze at a certain point when checking documents. If I specifically inserted the word on which it froze, it would simply lock up on the next unrecognised word with the hourglass cursor continuing its normal repeating pattern until I eventually used RESET to get out.

I talked to Colton Software last week who since reproduced the problem themselves and have promised to contact me as soon as they have a fix. **Cedric Peachey**

• **RS423 Problems** – I had been trying for a long time to get on to the Archive BBS (previously Eureka II) using my Archimedes and a Voyager 7 modem. Eventually, I found out that I probably had a faulty controller chip and I was told that its replacement was now a field change. I took my Archimedes along to my local dealer and asked him to replace the chip. When the engineer had finished the job, he asked me to pay £28.75. I told him that it was an accepted field change and that he should charge it to Acorn but he flatly refused and so I was left with little choice but to pay up. When I got home I phoned Paul B at the Archive office who put me in touch with Rachel Pullen at Acorn. After I had talked to her, she phoned my dealer and sorted him out! Within a couple days, a cheque from the dealer arrived by post. So, if you have problems with dealers, a little determination and a little help can go a long way. Acorn are trying hard to sort things out so be patient with them. **Chris Furlong.** A

Ed's Comments

• **Ceasefire?** Paul Fellows, the author of the ABC compiler has written to say that it is time to call a ceasefire in the BASIC compiler war. He reckons we should let the users read the reviews and decide on the relative merits of the compilers. Dabs Press have changed their advert in Archive to draw our attention to their newer products, Instigator and All-In Boxing rather than concentrating on their compiler. We are hopeful that Silicon Vision will take the same view and we can then avoid wasting any more of the valuable space in Archive.

• **DTP Editor Needed**. I think with all the interest building up, we need someone to co-ordinate all the available information about DTP – Acorn and others. Any offers anyone?

• **Fax is fun!** – Having just purchased a fax machine, I cannot understand why I didn't do so long before. It's brilliant and saves a lot of time – something we are a bit short of in the Archive office. We like to try to give good service to you, the readers, so when you order something we haven't got in stock, we want to order it quickly. The fax is a quick and accurate way of placing orders.

OK, it saves us time, but how can it help you? Well, if you are in a real hurry for something, you can send an order through by fax, including a fax of your cheque. If we have the goods in stock, we will fax you back an invoice number which you must put on the back of your cheque before you put it in the post (first class, please!). The number on the back of the cheque makes it clear to us that it is the confirmation of a fax order so you don't then get two lots of goods. We will try to get the order in the post the same day, knowing that a cheque is following.

• **Overseas customers** – the fax is the answer to (almost) all your problems. You fax your order through to us (45 seconds for a fax even from New Zealand costs less than a pound sterling.) We fax an invoice back to you showing the full cost including carriage and you send us a Eurocheque or go to your bank to get a cheque drawn on a UK bank or credit our Giro account 2341107 or do a direct bank transfer to Trustee Savings Bank, 69 Grove Road, Norwich, NR1 3RL, bank code 77–66–48, a/c number 90109660, a/c name 'Norwich Computer Services'.

I'm afraid though that, because of the unreliability of overseas mail, we will wait for the cheque before sending the goods. However, this method gets over the problem that, to get money out of some countries, you need to show the bank a pro-forma

invoice, presumably to prove that you are actually purchasing something and not just shipping money out of the country.

• **Hard Drive prices** – I managed to get my sums wrong when working out the prices of the Watford hard drives. They should be £295 for the 20M drive and £470 for the 40M. This includes VAT and carriage. Note that the Watford podules do NOT allow you to connect an external drive at a later stage whereas Computerware podules have sockets on the rear ready to link up to a second drive.

• **Mach Technology are alive and... well?** At the beginning of September, someone started a malicious and very unfair rumour on the bulletin boards saying that Mach Technology had gone into receivership. That is not true. I rang on 5th September and they assured me that there was no truth in the rumour at all. We still have not received anything for review and no one that we know of has actually received any goods from them so if anyone has had anything, perhaps they would get in touch with us as soon as possible. Thanks.

• **More for Charity** – We have now raised over £2,500 for charity through the magazine and we have decided that on the Careware front, Archive will do their part by matching the £3 that you give to charity when you buy a Careware disc. In other words, from now on, we are going to give the whole of the £6 from the sale of each disc to charity.

The Norwich Toy Library are now the proud owners of an Archimedes A410. We decided that since we were advising all our readers not to buy 310's because of the difficulty of upgrading memory and hard drives, it was a bit rough to expect the Toy Library to "make do", so we managed to find a spare 20M drive and a meg of RAM and a monitor that was a bit shop-soiled so that they could use the money you donated to buy a new A410 with educational discount from Acorn (thanks, Acorn!) and have a system they can really do something with! We'll try to let you know how they get on, but if anyone has programs written for Special Needs applications or would like to write some, we would love to hear from you.

• **Rumours abound** – There are all sorts of rumours flying around about what Acorn are or aren't going to be producing. For example, a multitasking version of FWPlus "due out before Christmas", a new WP – more of a 'document processor', a new machine with ARM3 and lots of RAM. Needless to say, I cannot get any confirmation about any of these but quite obviously they must be working on some new machine(s) with ARM3 otherwise why would they have developed it in the first place? What, when and what price are questions which remain to be answered.

• **The future of Archive?** One thing for certain is that when we run out of interesting technical things to say, we won't go all round the same old stuff again just for the sake of keeping the magazine going. Still, I don't think that is likely to occur because I think that Acorn will keep us supplied with new RISC-based machines for some years to come.

• **Response Forms** – What a response! Almost all those who have sent in orders and renewed their subscriptions have filled in our response form. Thanks very much – it is proving most useful. (Some people even filled in both the response form on the order form **and** the response form on the renewal note – identically!) Many of you added extra comments and quite a few took the trouble to write quite detailed comments. The trouble is, there is so much material to read through that it will take some time to assimilate. In the meantime, here are just a few initial impressions which you might find interesting.

• It's very clear that we need to do a more comprehensive survey of all the programs and datafiles available on the Shareware / Careware / Monthly Program Discs. In particular, it would be useful to know which bits are RISC-OS compatible. The trouble is, we don't really have the manpower (or womanpower for that matter) to do it ourselves. If anyone would like a free set of discs in return for doing the job of analysing and recording what is available and its RISC-OS compatibility (or otherwise), do let us know. The trouble is, it represents a LOT of work – there are now 41 discs

to look at, so it needs to be someone with a lot of spare time and dedication! Or perhaps it could be split between different people as long as we specified a common format for preparing the information for the magazine.

• Several people asked for an index for Archive, obviously not realising that Shareware Nº7 provides just that! Mind you, some would prefer to have a printed index, so would anyone like to have a go at transferring the disc info into a text file which we could then print out on the Mac?

• Requests for information on the C language were very common. As you will see, we have started an introductory series on C this month and we now have a C editor – Martyn Lovell. However, none of us in the Archive office knows C, so it's up to those of you who can program in C to send in the information for us to use.

• How about a computery cartoon? Yes, please. Any offers?

• With all the interest in DTP, we could do with a DTP column. Any offers of someone to edit it?

• There were a number of mentions of having repeats of earlier articles. That is OK if the information needs up-dating with RISC-OS, but we still have stocks even of the very earliest magazines if you want to read the original articles.

• A dedicated music/sound column? Yes, if someone will edit it and if people will send in the necessary information.

• Some have expressed disappointment with the quality and quantity of programs on the magazine program discs. This is accepted but it's difficult to know what to do about it. How about people sending in programs they have written that are copiously documented with REM statements to explain how they work.

• More articles on using !PAINT and !DRAW

• Use some of our "spare cash" to improve the magazine since it is you, the reader, who is paying for it? Well, a lot of the suggestions for improving the magazine can't be done by just pouring in more money. They take time and that is a commodity that we can't buy – well, not without employing someone else. The trouble is that with Ali, Sue, Adrian, Roger and Paul all in one room of a private house, there isn't room for anyone else. Hmmm!?

• Despite talking about constructional projects right back in some of the earliest issues of Archive, there hasn't been a single one in the whole two years. Yes, that has been a disappointment to me too. Those of you who know my background in Atom / BBC Micro and Electron interfacing, will realise how keen I am, but I haven't the time or the equipment (now that I don't teach at an F.E. college) to do anything myself. (Look back to the first editions of Acorn User and Electronics & Computing Monthly and I appear, not only as Paul Beverley but also as Timothy Edwards, Chris Searle and another name that escapes me!) A

20" MULTISYNC

The Oak PCM 20 multisync monitor is designed specifically for use with the Archimedes range of computers. It has external adjustments for width, height, horizontal and vertical position for each of 3 frequency bands and automatically selects the correct band for all Archimedes screen modes except 23 (hi-res mono). A TTL input is also provided for use with Model 'B's, CGA, EGA etc.

PCM20 ***£1495.00*** *P&P £15.00*

WORRA PLOTTER

Worra Plotter is a desktop utility which allows draw files to be plotted on HPGL compatible plotters. Pen speed, colours and paper size may be selected and output can be scaled and offset before being sent to the plotter via either of the ports, the network or to file.

Worra Plotter ***£29.95*** *P&P £4.50*

WORRA BATTLE

A challenging arcade classic demonstrating the amazing speed of the Archimedes. Pilot your high speed battle tank and attempt to destroy the enemy invasion fleet. Protect yourself from enemy fire by hiding behind the ancient monoliths or by using your limited flight capability. Watch out for the deadly heat seeking neutron fire. Stunning 3D graphics accompanied by realistic digital sound make this a game not to be missed.

Worra Battle ***£14.95*** *P&P £4.50*

SCSI CARDS AND WINCHESTERS

Oak's high speed 16 bit SCSI podule offers a new level of performance for the entire Archimedes range with data transfer rates of up to 1.3Mb per second, up to 2 gigabytes of winchester storage per machine and support for seven SCSI devices including 4 winchesters. The card provides a new filing system 'SCSIFS', an icon and filer for the Risc OS desktop. It can work in tandem with ADFS winchesters and is compatible with the PC emulator. Low level support is provided for other SCSI devices (e.g. tape streamers, CD Roms etc.) Internal winchester kits are supplied as plug in and go units with all necessary cabling and mounting hardware, and external drives are housed in sturdy metal cases, colour matched to the Archimedes, and have their own power supply and fan. External drives are also suitable for use with the A3000 - please specify when ordering. Drives up to 70Mb include a £10 voucher for Mitre's Disc Tree backup software, whilst drives over 70Mb include a free copy of Disc Tree.

Internal Drives *(inc. SCSI card)*	
20Mb	***£375.00***
45Mb	***£495.00***
70Mb	***£895.00***
SCSI CARD	
SCSI Podule only	***£199.00***

External Drives *(inc. SCSI card)*	
20Mb	***£535.00***
45Mb	***£655.00***
70Mb	***£1055.00***
100Mb	***£1450.00***
200Mb	***£1850.00***
330Mb	***£2400.00***

Extra external winchesters subtract £100 from price including card. P&P £15.00 on all drives (£8 for SCSI card).

ST506 WINCHESTER DRIVES

A wide range of both internal and external ST506 winchesters is available from Oak, making use of the Acorn hard disc controller. Internal drives are supplied with all necessary leads and mounting hardware, and external drives are housed in metal cases with PSU and fan and come complete with cables, socketry and metalwork for the back of the Archimedes. A 64Mb drive is available especially for use with the R140 and is supplied with software for partitioning between Risc iX and ADFS.

Internal Drives	
20Mb (65mS)	***£299.00***
40Mb (65mS)	***£379.00***
40Mb (28mS)	***£555.00***
47Mb (28mS)	***£650.00***
P&P £15.00 on all ST506 drives.	

External Drives	
20Mb (65mS)	***£349.00***
40Mb (65mS)	***£478.00***
40Mb (28mS)	***£665.00***
64Mb (28mS)	***£765.00***
64Mb (for R140)	***£795.00***

PARAMETRIC DESIGN TOOL

Oak PDT is probably the world's most advanced Parametric Computer Aided Design package. PDT works in a different way from traditional co-ordinate based CAD systems by storing mathematical and geometric relationships rather than simple co-ordinate information and therefore has several important advantages. Any edit made to a design automatically updates the entire drawing to cater for all the 'knock-on' effects of the change and hence allows design options to be quickly investigated and evaluated. Any drawing created within PDT is, in fact, a working model and so, for example, if an internal combustion engine is drawn and the crankshaft is turned, all the other components related to the crankshaft will automatically be moved to the correct position. Animation sequences may be automatically generated to show designs working. The mathematical behaviour of the design may be built into the drawing so that the model may be thoroughly tested even before any hard copy is produced. PDT supports 64 layers, a comprehensive range of geometric constructions, zooming and panning, automatic associative dimensioning and takes full advantage of the floating point co-processor if fitted. Hard copy output is to HPGL compatible plotters and Epson compatible dot matrix printers. PDT can output sprites to painting packages, and DXF files to other CAD software and !Draw - and then on to DTP or Risc OS printer drivers.

All prices exclude VAT *PDT* ***£359.00*** *P&P £6.00*

Oak Computers, Cross Park House, Low Green, Rawdon, Leeds LS19 6HA Tel:0532 502615 Fax:0532 506868

Oak Computers SCSI Drives

David Livsey & Ralph Barrett

We have the experiences of two of our readers with the Oak SCSI drives. David Livsey starts...

Having seen the adverts for both Oak and Lingenuity hard disks in Archive, I raided my piggy bank and decided that I could aspire to the dizzy heights of the Lingenuity 45 Mbyte drive. "Well," said Paul, when I phoned, "we can get one for you but there is a holdup. What about the Oak drive? We can get that for you with no trouble." and of course they did just that – why isn't every firm so reliable?

As I was travelling by motor bike (I was the biker on the big BMW who passed you in that traffic jam on the A11) I carried the package in a large rucksac and I do mean a large rucksac. I have never seen anything so well packed! Three days and 400 miles later (I travelled back to Exeter by the scenic route!) I unpacked the disc and podule and started the installation. Twenty minutes later I had finished! Yes, it was that easy.

The first step is to **unplug the machine from the mains** and any other peripherals, then take out the five screws to remove the case. The plastic front panel can now be removed after unscrewing five self tapping screws. One thing that I have not seen mentioned in any of the other accounts of hard disk installation is that the panel carrying the LEDs can easily be freed from the front panel, by removing two screws, making the positioning and glueing the LEDs very easy. I also unplugged the leads from the power indicator and from the speaker, enabling me to remove the front panel completely.

The drive screwed into place very quickly and easily using a screwdriver which I magnetised some time ago. I then fitted the cable to the drive before plugging in the backplane and SCSI podule. The drive power cable was plugged in and the case reassembled. Other articles suggest that refitting the front panel can be tricky so care may be necessary here – I had a few seconds concern until I realised that the printed circuit board was catching the bottom edge of the front panel. Oak supply a new label with holes for the power and hard disc LEDs. I did not use this as I'm not interested in flashing lights. In any case it is possible to see the green light through the 'Archimedes' label.

On switching on there was a horrifying groaning noise which rapidly quietened down to give almost noiseless operation. I was expecting the delay which resulted as the disc came up to speed and eventually the icon bar showed the SCSI icon for the hard disc. The disc comes already formatted and I, like many Archimedes users, wanted to partition the disc for use with MS-DOS. The program supplied on the Acorn Emulator disc was changed, substituting 'SCSIFS::4' instead of ':4' using the marvellous BASIC editor supplied by Acorn.

At this stage the first small niggle of doubt crept in. Things had gone far too smoothly – I **never** have a simple job! Sure enough, the program crashed. However, I had had a quick look through the very scanty documentation supplied by Oak (unusual for me) and remembered a reference to *KillADFS. This did the trick and a 10 Mbyte MS-DOS partition was created with no further hitch. All that remained was to *Configure Drive 4 and FileSystem SCSIFS and enable SCSIFS. Configuring Harddiscs 1 seems to have no effect other than putting an extra icon on the icon bar. *(This refers to ST506 hard drives, not SCSI drives. Ed.)*

The documentation from Oak is scanty but adequate and deals only with installation. I would have liked much more detail e.g. whether the disc is auto parking, some idea of access time (see later) and a list of faulty addresses. There are many ways of organising a hard disc but it is (in the end) I suppose, a personal thing. I have adopted the policy of having only sub-directories in the root directory as far as possible. I also use upper case for directory names and lower case for file names. It is necessary to set the system variables Run$Path and Load$Path using a !boot file in the root directory of the hard disc, remembering that the floppy is ADFS::0. Take care loading sub-directories – I was a little careless and found that the disc had 'gone

recursive' – it was loading a directory into one of its own sub-directories! By the time I realised what was happening I had about 15 Mbytes on the disc and this takes quite a time to remove!

The data transfer rate of a hard disc is, obviously, quite high. I was quite interested in comparing the ST506 drive used by Acorn with the SCSI drive supplied and a friend with an A440 agreed to do a simple data transfer test. The program used was a very simple loop within a loop. The heart of the program is simply *load <data file> 10000. This is done 100 times, five runs were timed and the average taken. My friend had a number of data files containing mixed text and integers resulting from a local half marathon and these were used as the test files. The results are as shown :

Size (K)	SCSI	ST506	ratio
119	20.00	47.3	2.36
60	13.33	27.11	2.03
35	10.00	16.44	1.64
6	3.34	3.51	1.05
4	3.33	3.4	1.02

Graphing the above figures does not throw any light on any relationships except to confirm that the SCSI drive is about twice as fast when transferring large amounts of data. One thing is apparent and that is the very strong dependence on the type of data. I realise that this is a very crude test but as a **simple** comparison it serves its purpose. If anyone would like to write a more valid test program (what is 'valid' in this context?) and supply a set of suitable files I would be quite happy to run them and make my figures available for general release.

The above represents my very limited experience of my own hard disc but I am convinced, from other experience, that the comment "serious users need a hard disc" is correct.

I would like to thank Paul Beverley for getting the drive and especially for the very welcome cup of tea. I would also like to thank Mike Green for supplying the data files and allowing me to quote his figures for the A440.

Now, Ralph Barrett gives us his experiences...

Oak SCSI Drives – I ordered a 48 Mbyte 28 mS unit from OAK on 19th June and received it on 29th July. *(i.e. it was one of the first drives that Oak shipped. \Ed.)* What I got was:–

1. Seagate ST157N unit (N=SCSI)

   I assume that the drive is a ST157N-1 (28 mS) and not an ST157N-0 (40 mS). At present I have no way of knowing.

2. Green LED for front panel (this was wired up the wrong way round! – It works OK now I've modified it).
3. Two fixing screws (arrived later in the week).
4. New front panel (not got this yet. However, I've modified the old one so that the LED can be clearly seen).
5. SCSI expansion card (containing 27128 ROM) and rear socket for external SCSI drive).
6. Floppy disc containing format program "SCSIFORM".
7. Manual (almost useless – virtually no information).

The reasons I chose the OAK SCSI were that Mike Harrison (alias Superman) had written the SCSI filing system and that OAK had some experience in supplying winchesters. I am impressed by the former and not much by the latter.

In Use

As the SCSI uses a different disc controller chip to Acorn's unusual offering (Acorn always choose disc controller chips that are virtually obsolete! e.g. the 8271 for the BBC Micro), the ADFS cannot drive SCSI hard drives. Therefore a separate filing system has been written called SCSIFS. This operates in a manner almost identical to an ADFS hard drive. These are the relevant facts:–

1. Seems very fast in use. Approx 640 Kbytes/second in Mode 12.
2. PC emulator works OK (must perform *KILLADFS command before starting). Also the program to create the partition must be modified so that all disk references are

SCSIFS::4.$.######### (this is not explained in the manual).

3. Most (if not all) RISC-OS welcome disk programs work OK with no modification. The only other program that worked first time was David Pilings !CHESS program. Other programs have to be pointed in the right direction to work (i.e. redirected to SCSIFS::4.$).
4. A special program SCSIFORM is supplied with the drive which works OK. As there is no ADFS, there is no "E" format and so there is a limit of 77 files per directory .
5. The drive capacity is 47.5M according to *FREE and 46.1M according to SCSIFORM. Even though the drive seems very quick I'm suspicious about the 28 mS access time. Most fast drives have auto-retractable heads (voice coil actuated). From the scant information contained in the manual, it is not clear if this is not the case with the Seagate unit.
6. Standard of the expansion card PCB looks good. It's not flow-soldered but very well hand-soldered.
7. The card can support up to four 512 Mbyte drives. In a couple of years these will be the norm – especially for graphics and sound use.
8. Compatibility with the Acorn SCSI interface (and others) is unknown. However, I put my trust in Mike Harrison even though he only writes software in his spare time!!!

Conclusion

OAK's internal SCSI works well, despite the points mentioned above. Its main features are speed and (potential) capacity. As these are the main reasons for having a hard drive, I can only recommend it. SCSI and EDSI look like becoming the new standards for hard drives. SCSI has the advantage of being around for longer and also supporting other types of medium (tape units, CD-ROM etc). A

Free Small Ads

• **A310 + RISC-OS** £650. Phone Horsham (0403)–66728 after 8 p.m.

• **A310 + RISC-OS,** original manuals and FWPlus. Phone 0705–370623.

• **A310 + RISC-OS,** 2nd 3.5" drive, 2-slot bp, ROM/RAM pod (CC) + 7 * 32k b-backed RAM + original manuals. Plus Artisan, ArcImEd, Alpha-Base, Arcade3, Alerion (all orig + manuals). All for £1100 inc carriage. Ennio Medici, Via Stazione 21, 18030 Bevera (IM), Italy. (Phone 0183–210068 but sorry, no speak English, only read.)

• **A310 base + RISC-OS** vg cond. Boxed with all manuals and system software. £680 o.n.o. David Bilsby on 0886–21457.

• **A310 base system,** nine months old + RISC-OS £650. Phone (Gloucester) 0452–500528.

• **A310 Entry** + Acorn backplane + RISC-OS + P.R.Manuals inc original packing & manuals £700 o.n.o. Also some software at half price: Zarch, Corruption, Terramex, Pacmania and Jansons Drawing Board. Ring 061–483–2983 evenings.

• **Ancestry,** new unregistered, £50. Ring Barry on 0270–623758

• **ANSI C release 2** immac. cond. £75. Phone 0903–200043.

• **CC ROM podule** with bb + 32k RAM £50, 2-slot backplane £20, I/O podule phone for price, Toolkit £20, Artisan £25, Control Panel £6, Enthar 7 £18, Ibix £12, Orion £8, Jet Fighter £8, Hoverbod £8, Missile Control £8, Terramex £12, Corruption £16, Arcade3 £8, Overload £8, Quazer £5. Phone Iain on 0925–66889 (7.30 – 10 p.m.)

• **Dutch BBS** is looking for PD or own written programs. Send a disc with programs and short description and you will receive a PD disc in return. GNOME BBS, Honesbrink 32, 7544 MP Enschede, Holland. (Phone Holland -53-763038)

• **EMR SoundSynth** £20, Arctist Plus £10, Acorn MIDI podule £40 o.n.o. Phone 01–655–0399

• **For Sale:** RenderBender £35, Minotaur £9, Space-Trader £11. Ring Alistair on 0482–634852.

• **InterWord** (disc version) plus manual £20. Phone Roger Attwood on 0232–429674, evenings 6 – 10 p.m.

• **North America** – A310 + RISC-OS $1700 (Can$) 110V PS, mint, software/manuals, owner upgrading. Deliver in person or by courier. Gerry Wolfe 1–416–880–4715.

• **Wanted** – Acorn 3.5" disc upgrade for A310. Phone 0625–29363.

• **Wanted** (cheaply!) ProArtisan or Atelier (£50 max), Instigator (£20 max) or Pipedream (£50 max). Phone Iain on 0925–66889 (7.30 – 10 p.m.)

• **Wanted** – Studio 24 Plus. Also MIDI podule for A310. Phone 0872–865449.

• **Z88 brand new** + carry case, 128k RAM, Archie link, mains adaptor, 'Using your Z88'. All for £195. Phone Steve on 0533–715497. A

Charity Sale

Offers for these items to the Archive office. Prices are minimum. Please offer more if you can as it is for charity. Thanks.

• **Arc Buffer** (software printer buffer) (£5 min)

• **CC ROM podule** with battery backup (never used) + 32k RAM chip (£40 min)

• **CC ROM podule** with battery backup (£30 min)

• **First Word Plus** (up-graded to work under RISC-OS) – £40 min.

• **Healthdata** (offline viewdata system) (£5 min)

• **Sage Bookkeeper** (£5 min) – Uses PC emulator – 5.25" disc. Small business bookkeeping and accounts.

• **Startrader** (£8 min) A

Help!!!!!!!!

• **MX 80 users!** – Has anyone managed to use the Epson MX80 successfully with either Designer Intro or Graphic Writer? Arthur Duckett, Telford.

• **Pendown** – Has anyone succeeded in getting Logotron Pendown to work under the !65Host emulator as a ROM image. Richard Knights, Totnes, Devon

• **Teletext** – We've had a number of enquiries about accessing data from Teletext (e.g. share prices) and about how to get those figures into a spreadsheet under software control. Could anyone write us an article about this? Can it be done, even?

• **Training materials** – Surely there must be universities, colleges and even schools who have produced training materials on various aspects of the Archimedes. Could these be made more generally available? Let us know if you have something that could be distributed and we will let others know about it.

• **User Group in East Lancs?** Is there an Archimedes (or even more generally Acorn) User Group in East Lancashire? Cedric Peachey, Sabden, Lancs.

• **Complete Wordwise Plus Handbook** – We put an advert in Micro User to try to get rid of the last remaining copies of my old book but they have sold so well that they have now all gone and we are still getting a lot of orders! Do any of you have copies that you are no longer using? We could sell them for charity to the people wanting them.

Help offered...

• **Packet radio** – W.N.Rodger has written a packet radio program for the Archimedes and is willing to distribute it with no charge or donation. You should send him two discs and the cost of the return post and packing. His address is 5 Burns Nurseries, Off Wooton Road, Kings Lynn, PE30 3BG. A

A4 Forms Manager

Doug Weller

This was one of my favourite programs on the Master, now upgraded and even better on the Archimedes (RISC-OS only). It is, simply but elegantly, a program to allow you to design forms, A4 vertical and landscape and Filofax size. It was written for the BBC Micro by a secondary school science teacher who has continued to upgrade it as he and other users think of useful additions.

It is very user friendly, with a number of sample forms to show you what it can do (and which can easily be modified to suit your own purposes). Basically, it allows you to draw straight lines vertically and horizontally and enter text to create forms, which can be printed out using the computer's characters or the printer's, including NLQ. The latest version allows you to combine normal text with 1 of 4 double-height fonts (an additional disc has 8 more fonts).

This is extremely easy to use, so timetables, assessment forms, class lists, worksheets, diary pages for your personal organiser, etc can be quickly created. You work on an A4 size screen (for A4 forms) which scrolls horizontally and vertically. Box copy and delete functions are provided which can speed up the work of creating complex forms considerably. Box copy now also allows you to copy a box between different forms.

But this is not all. Markers can be inserted at any place and data spooled from any WP loaded in. This means one form can be used for several class lists, diet sheets, timetables, etc. (I used this a lot last year for athletics score sheets for different groups of children, and for mark lists for different subjects.) Again this has been upgraded since the original BBC version and a function to sort either alphabetically or numerically has been added, as has a multiple forms function so that using the same form for several sets of data is extremely easy.

This is an extremely practical and useful program. At £27.95 from Mewsoft it is well worth the investment. A

Introduction to C – Part 1

Chris Dollin

Part One: Hello World!

In this series of articles, I hope to introduce you to the C programming language. C is now over 15 years old and should shortly be standardised by ANSI (the American National Standards Institute). The standardisation process has introduced various changes to the language and I shall normally be describing the new version, known as "ANSI C", which is what Acorn purport to supply. However, one of the later articles will discuss differences between ANSI C and "classic" C, and you will be happy to know that most well-behaved classic C programs will be accepted – with, perhaps, much sound and thunder of warnings – by ANSI C compilers.

Acorn recommend Harbison and Steele's book "A C Reference Manual, 2nd Edition" (Prentice-Hall). An alternative is Kernighan and Ritchie's book "The C Programming Language (second edition)" (Prentice-Hall). (The first edition of this book was the reference source for classic C.) There are any number of introductory books on C available; browse the computing section of your local bookshop. If you have a friend in the field, get them to recommend one. Remember, however, that pre-ANSI books may mislead you if you are using the revised language.

I'm going to introduce C by way of some trivial examples. Bear with me: C is a tricky language, and the examples will let me introduce things about it a little at a time, rather than all at once. Sometimes I will contrast C with other languages, usually Pascal and BBC BASIC (which I will shorten to just "BASIC").

Busy doing nothing ...

C programs contain 'definitions' of three kinds of things: 'types', 'variables' and 'functions'. Our first example is a C function which does nothing. Even this can be useful, as it may be a place-holder for future program development.

```
void do_nothing(void)
    {}
```

The first 'void' is the 'return type' of the function. It says that the function does not return a value, so it is like a BASIC PROC rather than a FN. The function is called 'do_nothing'. After the name comes the 'parameter list'. The case '(void)' is special, and says that this function does not take any arguments.

You might think that no arguments would be written as 'nothing' (as in BASIC or Pascal) or perhaps empty brackets, '()'. For historical reasons, discussed in a later article, '()' means something else, namely that 'nothing is being said' about the arguments to the function. Missing the brackets out completely would turn the definition into a 'variable' definition rather than a function definition.)

The return type, function name, and parameter list form the functions 'header'. After the header comes the 'body' of the function, which describes what the function does. The body appears between the braces "{" and "}". There is nothing between 'these' braces, so nothing is done.

... Working the whole day through

Our next example still does nothing, but it does it by using the definition of 'do_nothing' we already have.

```
void do_nothing_twice(void)
    {
    do_nothing();
    do_nothing();
    }
```

There is nothing new about the function header, but the body is more interesting. It consists of a series of 'statements'. Both statements are the same: each is a 'call' to the function 'do_nothing'. A function is called by writing its name and then its arguments in brackets. 'do_nothing' was declared as having no arguments and there are indeed no arguments

between the brackets. (Writing '(void)' is not permitted here.)

Strictly, the call to 'do_nothing' is an 'expression', not a statement. It is the semi-colon which converts it into a statement. Pascal programmers beware: this is not the same as Pascal, where semi-colons **separate** statements. C is very fussy about semi-colons.

One, two, buckle my shoe ...

Our next function is a little less trivial.

```
int return_one(void)
    {
    return 1;
    }
```

The return-type of this function is 'int', which is short for 'integer'. On the Archimedes, int's are 32-bit values, which means that they can hold numbers in the range –2147483648 to +2147483647 (the same as in BASIC and Acorn Pascal). A function with a return-type (other than 'void') must execute a 'return' statement in its body. The value of the function is given by the value of the expression that follows 'return', which must have a type matching the functions return-type.

Note that the function exits (in the manner of a BASIC 'ENDPROC' or '=' statement) when it executes a 'return'. A function with return-type 'void' can exit using a 'return' with no expression. A 'return' statement ends with a semi-colon.

Expressions and arguments

We have mentioned expressions several times above. The usual operators can be used for combining values of type 'int', such as addition, multiplication, subtraction and division. Our next example computes the average of its arguments.

```
int average( int x, int y )
    {
    return (x + y) / 2;
    }
```

'average' has two arguments, both int's, one called 'x' and the other called 'y'. Calls to 'average' with the wrong number of arguments or with arguments of a type not matching 'int', are reported as errors by the compiler. The result of 'average' is half the sum of its arguments. Note that when int's are divided, the result is an int, and (as is common in programming languages) integer division 'truncates', so that

```
average( 1, 4 )
```

will compute 2, rather than 2.5 or 3.

Taking functions from the library

So far, we have only defined and used our own functions. C comes with a collection of standard functions which we can use to perform operations such as input, output, string manipulation and mathematical functions. Here is a function that will print a message on the screen.

```
void say_hello(void)
    {
    printf( "Hello!" );
    }
```

The function 'printf' is part of the standard C library. It prints its first argument out to a place called the 'standard output', normally the screen. The argument must be a 'string', which is a sequence of characters enclosed in double-quotes. ('printf' can do a lot more than just print strings, as we'll see below.)

In order for the compiler to be able to check calls to 'printf' for correctness, it must be told about 'printf' in much the same way that the calls to 'do_nothing' in 'do_nothing_twice' can be checked against the definition of 'do_nothing'. A file containing C code that uses the standard C input/output should contain the line:

```
#include <stdio.h>
```

near its top. (We'll explain what we mean by "near", and what this line means, later on. For now, at the top will do fine.) This ensures the compiler knows about the definition of the standard input/output functions.

'printf' prints the characters in its string normally until it meets a '%' character. The characters following the '%' tell it to output the next argument in its list in a particular way. Three immediately useful options are:

%% – print a "%"
%d – print an integer in decimal
%s – print a string

which allows us to write a new function:

```
void print_average( x, y )
    {
    printf( "average( %d, %d ) =
                        %d\n", x, y,
                average( x, y ) );
    }
```

The first '%d' will print the value of the argument 'x', the second will print the value of the argument 'y', and the third will print

the value returned by the call to 'average'. The final '\n' in the string represents a 'newline' character, which is printed as carriage-return followed by line-feed. The numbers are printed with no padding. So the call

```
print_average( 100, 27 )
```

would generate as output

```
average( 100, 27 ) = 66
```

Mainly comments about programs

So far we have discussed C functions in isolation. How do we run functions from 'outside' a C program? Every C program should define a function called 'main'. When the program starts, C arranges that 'main' is called, passing it a description of its command line.

The first argument for 'main' is a count of the number of words on the command line (including the word which named the program). Its second argument is an array of strings, each string being one of the words. For example, a do-nothing C program is:

```
int main( int argc, char *argv[]
    )
    {
    /* Do nothing, for there's
            nothing to be done */
    return 0;
    }
```

The incantation 'char *argv[]' declares 'argv' as an array of (pointers to) strings. When we discuss arrays and pointers in our next article, this should become clearer. The 'comment brackets', '/*' and '*/', enclose commenting text that is ignored by the language, like BASIC's 'REM' statements. Unlike REM, C comments can extend over as many lines as you like. This can have unfortunate consequences, as a mis-typed '/*' or '*/' can eat your program alive and leave you with a real puzzle.

'main' returns an int result which indicates the 'exit status' – success or failure – of the program. By convention, a result of '0' means success and any other result means failure. The value is made available to the environment which ran the program.

Hello, World, whoever you are

We'll close this article with a complete program which prints a hello message to whatever is named on its command line.

```
#include <stdio.h>
int main( int argc, char *argv[] )
    {
    printf( "Hello, %s!\n",
                        argv[1] );
    }
```

If you have Acorn C, you might like to try this. Experiment with differing numbers of command line arguments, printing the value of 'argc', and changing the '1' to other values.

In the next article I shall be talking about:

– local variables
– pointers and arrays
– if, while, and for
– assignment
– more about expressions A

If you have any constructive comments about this article (or any article for hat matter) or about what else you would like to see covered in this series, write in to the Archive office. If you have problems with your 'C' programming or hints and tips to offer, send them to Matryn Lovell c/o the Archive office. Ed.

Archive BBS – 10,000 and counting

Alan Glover

On 23rd September, the Archive Bulletin Board (formerly Eureka II), had its 10,000th caller. Congratulations to Ray Loades-Bannon!

To coincide with this, the board software has had quite an overhaul, hopefully making it a bit more understandable to first time callers, and more useful to experienced ones. Thanks as usual to everyone who has suggested ideas.

Some people have wondered why a definitive guide to using the board hasn't been produced. There are two reasons. The first is that the software is evolving continually (as you will see if you read on) and secondly that the board will be going multi-line as soon as new multi-tasking bulletin board software is complete.

However, I thought it would be helpful first of all to give a 'first time callers' guide'...

What to do the first time...

Archive BBS works at V21, 22, 22bis and V23. In all cases, TTY terminal emulation and 8 data / no parity / 1 stop bit (8N1) should be used.

When you get through (keep trying... it is fairly busy these days) you will get the board's introductory screen. After that you will be asked to enter account number, or press <return> if you are a new user (or have forgotten your number). NOTE: This is **not** your Archive membership number, but an arbitrary number chosen by the board. On your first call, press <return>. Then type in your Christian name and surname. Try to avoid initials etc. in between. Once it is correct, press <return>. The board will echo what it thinks you typed and ask you to press <Y> to confirm it. The board will then check your name against the current user base (about 600 people) to see if it knows you. If it does, it will ask you for your password. This is actually the path you have to take if you can't remember your account number.

As a new user, the board shouldn't find your name (if you are new and someone with the same name is already on the list try some variation on it – e.g. a middle initial, or an alternative first name/ nickname). It will ask if you are a new user. If you reply <N> the board will assume that you typed your name wrongly and let you try again.

Registration

You now get to the Registration section. Here you are asked to provide four pieces of information by which the board and other callers can identify you. You are asked to type your first name, surname, town/city you're in and a password. This password is your own personal password which is your security of access to the system. Choose one that you can remember and no-one else can deduce! This password has no relationship to the Archive Registration word – of which more anon.

Password, please

Once you have chosen your password, the board will issue you with an account number. Remember this number: in future you will be able to call in using just your account number and password. Then you get a three way menu offering S to save the details and proceed, C to change them or L to log off. Type S to save the details (providing they're correct of course!!). The program will then double check the information to ensure that you cannot be confused with anyone else. Once this has been completed, you get the point at which all future calls will begin... The board displays the enter account number prompt. Type in your newly allocated number (without the # – that's common mistake number 107!). Then press <return> and type in your password and press <return>.

Providing nothing has gone wrong you will now see various pieces of information about the board, such as the current time, how many callers have been on and so on. Just before the next prompt, you are given any hot news about the board – e.g. any bugs to avoid, brand new features etc. This is followed by a random quote/saying/idea generated from Fortune Cookie (one of David Pilling's conversions for the Archimedes). This serves no useful purpose...

apart from bringing a smile to your face and reminding you that we shouldn't be serious all of the time (any of the time ?).

Menus – long or short?

The next prompt allows you to choose which kinds of menus you want. If you choose <N> (recommended for the first few calls), the board will give you a summary of what each single character command means. Alternatively <E> will just give you a prompt, containing the possible commands from that menu. Whenever a question mark is shown in the menu, it means that by pressing <?> you will get the novice display for that particular menu. This is useful if you are in E (expert) mode and have forgotten a command, or are in N (novice) mode and noise has corrupted the first display.

The next prompt is entitled Bulletins, with options 1 to 5 and ?. These are text files outlining points about the board. Read bulletins 1 and 2 at least before proceeding. When you have read all the bulletins you want to, press <return> and the program will proceed to the main menu.

R for Archive registration

You will probably feel absolutely overwhelmed at this point! There a lot of options. Fortunately most of them will become self-evident with a little experimentation. This is to be encouraged – that's how most of the bugs get found! To register yourself as a member of Archive press <R> and then type in this month's registration word which at the moment is 'EGRET'. Incidentally, I change the word on the day I receive my copy of the magazine – so in exceptional cases someone using an old word may find it has already changed.

Press D for files!

If you want to see what files are available on the board or to upload a file, select D. (Historically it is D for downloads but now of course it includes uploads!). If you want to see the files uploaded since your last call press <Y> and then when asked if you want a continuous view of the file list, press <N> if you want to read them individually or <Y> if you are spooling the descriptions to a text file. You can then select the area you want to use.

Press <C> for change (areas), and then <?> to list the areas in use. Then there are a number of commands for examining the files and uploading – experimentation is suggested here to get the hang of it. In most cases pressing <Q> will take you up a menu, until you return to the main menu.

Open messages

To access the open message areas press <O>. Afterwards the commands are very similar to those for the file sections. To send a private message to someone use <!> from the main menu. When you have finished, you should leave the board by selecting <G> from the main menu. You then have an opportunity to leave me a message and then to confirm that you really want to leave the system.

Almost all of the files on the board have been compressed using either the ARC program or David Pilling's Spark. So, you must also have a copy of these if you want to download files. There is now a public domain demo version of Spark called Spark-Plug, which can be used to extract files. You will find an uncompressed version of the latest ARC in file area 2, near the beginning, and the latest version of SparkPlug towards the end. Sparkplug is compressed, so you will need to download both ARC and SparkPlug if you are starting from square one.

If you are confused about anything on the board you can see if I'm about by pressing P from the main menu. This will either sound an audible alarm if I'm about, or offer you the chance to leave a message when I'm not.

So what's new?

I mentioned earlier that there are a number of new facilities which have progressively appeared over the last couple of weeks. Here's a quick summary for anyone who's not be been on for some time. In this part I'll assume you're reasonably familiar with the general principles of using the board.

- **Xmodem file protocol**

The board only used to support 128 byte Xmodem checksum. It now offers CRC and/or 1K blocks as well. You can select your preferred protocol by <D><N> and then chose <V>, <W>, <X> or <Y> from the main menu. The board will remind you

which is selected just before beginning any Xmodem operation.

• Call cost estimation

This is one of the problems of using dial up systems. However Archive is better value than you might think at first. Firstly, being located in London many callers get to be charged at b1 rate instead of b rate when calling from outside 56km (approx), and the board is a local call from most areas adjoining London too. Secondly, there's no additional charge such as a subscription fee. However, the sight of the phone bill can still be a shock to the system. With that in mind, the board will now estimate the cost of a call to it, given the charge rate band you are calling from. From the main menu select <K> and then <L>, <A>, <1>, or <B> to specify Local, A, B1 or B rate. Then you can see the cost of the call so far by using <T> from the main menu. Other information will be displayed too, such as the time you have been on and the time per unit. This is also shown as you log-off.

• File List

The board has over 20Mb of files for download. This is the figure for the ARCed files, so in reality it is probably getting on for 50-60Mb. This does mean that finding a file can be a bit of a pain.

You can now download a full list of all the files available on the system. The file is ARCed, since text files usually shrink to just under half their original size. To download it, select <D> <N> <L> from the main menu. The list is automatically re-generated daily.

• ARCed message upload facility

The facility for downloading and uploading new messages and private mail has been running smoothly for some time now. However, if you uploaded a private mail message with the name mis-spelt, the board used to just reject the message completely.

Now, it will tell you that the name cannot be found and then suggest possible people you may have meant. It achieves this by looking through the userbase for any name which has one of the names you entered. This works on the idea that one name would be wrong and the other correct. You can then type in the name or number of the person you want to send it to or abandon the message.

• Aborting and skipping text

Although the board offers <ctrl-S>, <ctrl-Q> and <ctrl-A> at various points for skipping or aborting, they are not that effective in many cases. So, a new command, <ctrl-F> has been introduced which should abort just about anything and display a prompt. In particular it provides a way out of non-stop download or message scans. It can also be used as a speed-up at slower baud rates. E.g. if you are displaying the list of sig areas you can type CTRL-F after you've seen the one you want and proceed without having to see the rest.

• Changing last log-on date

This facility has been available since the board began but in its location of <C> <L> from the main menu was rather well hidden. It is now also accessible from the main menu using <E>. This should be used if you get cut-off and have to call back, so that you can reset the date that new message/file scans should begin from.

• Changing between expert and novice menus

This too is an option that comes under <C> in the main menu. It is now duplicated in the main menu, by using <X>.

• Daily Backup

Since the hard disc crash in May, when I lost about two weeks messages and uploads, I have introduced a daily automatic backup of the system's transient files. This occurs at 2 a.m. each morning... or as soon as the caller who is on at 2 a.m. logs off. So if you call around that time and get as far as the modem but don't get anything else, drop the call and try again in about ten minutes.

As an Archive BBS user, I want to thank Alan for all his hard work in setting the whole thing up and running it so efficiently. For me, the most important improvement is the archived messages facility. Each day, I log on at around 7 – 8 a.m. and download all the new messages (which includes my private mail), pop into the download file section to

get a list of new files that have been uploaded since my last call (I have asked Alan to include this on the automatic message download!). All this takes only a couple of minutes. Then, after finishing the call, I unarc the file and spend a while reading through the messages and responding where necessary. I make myself a list of any downloads I need, arc my messages file and (try to) log on again. When I find the board free again and get on, I up-load my messages, download the downloads I want and finally do a quick scan for messages and downloads that might have appeared in between my two log-ins. I'd be lost without it!

The other major benefit of using Archive BBS (or SID for that matter) is that Phil Colmer answers questions and queries so rapidly. So if you are doing some serious programming, the ability to get technical questions answered quickly is worth its wait in gold. Ed.

P.S. I called in this morning and left message number 1,000!

Hi-Tec EC2400 Modem

John Eden

Very rarely am I excited by any form of computer product or peripheral device these days: however, the EC2400 modem from Hi-Tec Supplies is a pleasant exception. This is a quad speed intelligent modem which features auto dial, auto answer, baud rate scanning, MNP error correction with data compression to class 5 and lots more besides. The modem certainly seems to pack a price to performance ratio which is going to be hard to beat and it is built in the UK by a British company too!

Switches and connectors

The rear panel has a socket to enable parallel connection of a telephone handset, a 25 way D type connector for the RS232 cable and a bank of eight dip switches. The pin out of the RS232 port conforms to the CCITT V24 standard, so connection to the computer is straightforward. The dip switches enable the modem to be powered up with speed settings and control signals set to reflect the switch positions, or the switches can be ignored in which case the power up configuration is taken from battery backed memory.

The front panel has just an on/off switch and a bank of eleven LEDS, grouped functionally, to indicate the status of the modem and speed of connexion. The modem is supplied with about 3 metres of telephone cable and thoughtfully the mains cable has a plug already fitted.

Controlling the modem

I was pleasantly surprised to find that the EC2400 can be controlled with either Hayes AT commands or European V25bis commands although I did not try to operate it with the latter. An extended Hayes command set is employed to allow control of all the extra features provided by this modem, and I had no problems using it with the Hearsay comms package. The EC2400 will automatically sense the speed and parity of your terminal and this can be used to determine the speed and parity of connection. Alternatively the connection speed can be independent of terminal speed and the modem will buffer this, so flow control must be used to avoid loss of data.

At first sight the extended AT command set may appear a little daunting but most of the commands default to sensible values, so in reality you will only need to use a few commands regularly. Any changes you may want to make to the default settings can be saved to battery backed memory so that the modem always powers up or resets with these settings in force. The factory defaults can be restored at any time with one simple AT command. As mentioned earlier, the dip switches may affect some of the default settings on power up.

Operating speeds & modes

The EC2400 supports the four commonly used speeds, V22bis, V22, V21 and V23 and can operate with all MNP error correcting modems to class 5. There appears to be no support for local split rate

working between the terminal and modem. The modem speed selection can be configured in four different ways:-

1) Auto scan line speed, terminal speed independent. 2) Auto scan line speed, adjust terminal speed to match. 3) Set line speed to scan down from terminal speed. 4) Connect at pre-set line speed, auto scan disabled.

I found the easiest way to use the modem was to set the terminal to 9600 baud and enable local flow control and then set the modem to auto scan. With the modem and terminal set up in this way you can connect to any speed, even split rate 1200/75 without worrying, as the modem always buffers the difference.

MNP error correction

What sets this modem apart from the competition is its support for MNP error correction. When a reliable link is being established, the highest class of MNP supported by both modems is selected and then this is used during the link. This means that any modem that supports MNP can establish a reliable link with any other modem that supports MNP. In fact the EC2400 implements MNP to class 5, which allows for error correction and data compression. This gives a typical throughput of 4800 baud from a 2400 baud connection!

I do not have enough time or space to explain the intricacies of the MNP protocol. Suffice it to say that the data is parcelled up into "packets" together with a cyclic redundancy check which the receiving modem uses to verify its integrity. If there is an error, the modem requests the packet again. The packets are retained within the transmitting modem's buffer until acknowledged as received without errors. All the error checking, data compression and re-assembly is carried out by the two modems, and requires no intervention from the terminal or user.

With a good line, data streams in so quickly that you cannot read it. Spooling to disc is essential and enables you to read your messages and mail off-line later. The EC2400 was a joy to use in this mode and even returning to a normal 2400 baud connexion seemed slow by comparison!

Documentation

The user guide is A5 in size and has 128 ring bound pages. Two quick get-you-going sections, one for normal operation and one for MNP error correction, highlight the steps required to establish a call. There are short sections on installation, controls and hints & tips and these take you through the initial setting up of the modem. Two comprehensive sections are provided for the AT commands and V25bis commands. The manual is generally good but could have done with some better proof reading. There are far too many typographical errors to be excused, some potentially confusing like / instead of \, and 0's & O's and 1's & I's transposed.

Styling

My one major criticism of the modem is its styling and looks. It is housed in a traditional black ABS plastic case measuring 170mm x 200mm x 50mm approx. which in itself does not look bad, but the front and rear panels are finished(?) with grotesque red labels which look decidedly amateurish. In my opinion the LEDS are three sizes to big, set too far back from the front panel which has window apertures that are too large. This needs improving if the appearance is not to detract from an otherwise excellent product.

Conclusion

The EC2400 performed very well during the review period apart from one bug in the software to do with the "black-listing" of telephone numbers which popped up from time to time. The modem should now be supplied with a new version of the software, which will be available as a free upgrade to existing users.

The EC2400 is as yet not BABT approved but this is being actively sought by its manufacturers and may have been granted by the time you read this. In its unapproved state, the modem is being sold for the real bargain price of £279 including VAT. I understand that when the modem gets its BABT approval it will be renamed the PRO4 and have proper screen printed front and rear panels and a new, more comprehensive, user guide. The price will also go up to £399 exclusive of VAT.

Verdict

There are already a great number of bulletin boards and conferencing systems which offer connections using MNP error correction and the number is growing all the while. Indeed there are plans to add MNP to the Archive BBS soon. The EC2400 allows you to connect to these reliably and, where compression is used, can reduce your on-line time by as much as 60%. Even at £399 the modem is still excellent value for money – modems offering a similar specification cost between £600 and £800.

If you are thinking of buying a modem then the EC2400 should be near the top of your list.

Hi-Tec Supplies Co. 611 Lincoln Road, Peterborough, PE1 3HA. (0733) 52440 A

Alan Glover has some experience of the EC2400 and is not quite so impressed. He feels that at £460 it is no longer cheap for what it offers and that it would be better to go for one of the more expensive ones like the Quattro or Miracom Courier.

PipeLine

Gerald Fitton

Well, here we go with a new column. First of all I would like to thank all those who have sent letters to me. Please don't be disappointed that your contribution hasn't appeared this month. I have to meet Paul's deadline and haven't yet had a chance to digest all your remarks. As a general remark, if you have quite a bit to say, it would be helpful if you could let me have a disc copy of your letter (or comment) so that I can edit in the bits I need for the article. All discs will be returned (particularly if you put your name and address on the disc label).

Many of you will use the versions of PipeDream earlier than the windows version 3 to generate ASCII text and load it into !Draw for printing. Some of you have "complained" that the printer driver !PrinterDM chops off some of your picture. Although not strictly a PipeDream problem, the solution has a place in this column because of this use of PipeDream. The problem can be cured by carefully setting up the page size of the printer driver as follows:

- install the printer driver on the icon bar and then click the menu button and select the page size sub menu.
- set the top and left margins to zero (0.00) – you can also set the right and bottom margins to zero at the same time.
- load !Draw and draw some lines which go right into the top left corner of the picture
- print this picture and then measure (as accurately as you can) the distance from the top of your paper to the top of the printed picture
- reselect the page size sub menu and make this distance your top margin
- measure the left margin and enter this in the page size sub menu in the same way
- measure your paper size and, if you are not using a standard size such as A4, change the paper size in the paper size sub menu
- draw a few more vertical and horizontal lines (preferably use the grid lock and a simple spacing – e.g. 10mm spacing) and print. Measure the distance from the right hand edge of what is printed to the right hand edge of your paper. This is your right margin. The bottom margin is a little more tricky but you set it the same way but increasing it a mm or two to give you a small reserve.

Now if you use the Misc / Paper limits / Show sub menu of !Draw you will find that the shaded area of the !Draw screen is exactly the bit which is not printed. If your left and right margin differ greatly you may want to move the printer feed mechanism to centre the paper in the printer.

One final word on this. !DTP works differently so set up the !Draw screen first. For those buying the monthly disc a !Draw file containing a suitable picture is included as "Rectangle". Let me know if you have any problems – preferably on a disc! A

ARM3 Preview

Brian Cowan

Aleph One have launched the ARM3 upgrade for the Archimedes range. In a previous article I explained the philosophy behind ARM3: it is essentially the old ARM2 with an on-chip 4 kbyte RAM cache. While the ARM chip runs ordinarily at its old speed, all ARM-cache transfers may be clocked considerably faster. The consequence of this is maximum upward compatibility of software with considerable speed improvements. All programs should exhibit some speed improvement, but applications specially coded to use the cache can run considerably faster. RISC-OS is a case in point.

The hardware

Aleph One's ARM3 upgrade consists of a small four-layer printed circuit board about two inches by three inches. Mounted on this board is the ARM3 chip, the new clock, a few chips and some decoupling capacitors. The whole assembly plugs into the Archimedes board in place of the old ARM chip, underneath the floppy disc drive. It is thus out of the way of podule expansion cards and is well protected.

Cache-on and Cache-off

It is the RAM cache which is the important feature of ARM3. When the cache is unused, the performance is similar to that of an ARM2, that is, an ordinary Archimedes machine. Software support for the ARM3 is in the form of a relocatable module which turns the cache on and off and which can also indicate the state of the cache. In the desktop, this is done with the aid of an icon on the icon bar. Otherwise there are the "star" commands: Cache-On and Cache-Off. That is all there is to it!

Speedy windows

The Archimedes desktop (in RISC-OS) is already pretty impressive. The windows move responsively even when set for instant motion but with the cache turned on, the performance is quite remarkable. The movement is much smoother. Even when working with large documents in Edit, the screen rewriting is almost instantaneous. It is quite obvious that the RISC-OS window manager was written to exploit the projected RAM cache – the desktop has a completely new "feel" to it.

BASIC tests

I was particularly interested to see how ARM3 performed when running BASIC programs. This is of interest since in BASIC, no speed increase is obtainable with the Floating Point Coprocessor (at least, not with present versions of BASIC). I ran a number of programs, including floating point-intensive number crunching programs, as well as various screen plotting and graphics programs. On average there was a speed increase of about four times. For the record, I also ran a set of benchmark tests. I certainly don't want to get into any more arguments on the merits of running benchmarks, but they do give standards for comparison. This is what I found:

Benchmark	CacheOn	CacheOff	Ratio
Ackerman	1	3.36	3.36
Fibbinachi	175	702	4.01
For Loop	4.6	22.12	4.80
Multmath	0.37	1.67	4.51
Pi (1000 places)	44	180	4.09
Real Array	0.41	1.64	4.00
Real Math	0.06	0.26	4.33
Repeat Loop	2.71	11.85	4.37
Savage	1.22	3.68	3.02
Sieve	1.21	5.51	4.55
Star Array	0.24	1.05	4.38
Tak	4.93	19.00	3.85
Textscrn	1.13	2.33	2.06
Triglog	0.29	1.04	3.59
While Loop	2.06	8.15	3.96

Doing Algebra

One particular package I have been using recently is REDUCE, a computer algebra program. This is written in Cambridge Lisp and it is part compiled and part interpreted. Ordinarily, REDUCE is run from the command line with the single task taking over the entire machine. This is sensible since these sort of programs are very hungry for memory. I ran

a number of comparison tests in this mode and I found a speed increase of between 1.5 and 2. I must confess that I was quite disappointed by this. However, it is quite understandable precisely because of the extensive memory usage of the program, the fast cache is then not such a lot of use. It is possible that a future version of Cambridge Lisp may make better use of the cache, but I think a new Acorn release is unlikely.

Edit task windows

Things were slightly better when running REDUCE as an Edit Task. I had originally "hacked" the program slightly, to make it run as a task, to obtain the benefits of the desktop: simultaneously editing text files and scrolling back over a session record. When running as an Edit teask, there is a speed reduction of about 0.8 even if the CPU is not engaged elsewhere. I found that when running with ARM3, the speed increase was between 2 and 2.5 times. The indication is that the loss by running in a window has been recovered. This was very welcome. It indicates yet again how the desktop makes particularly good use of ARM3's RAM cache.

PC emulator

I ran the PC emulator with great interest. It is commonly stated that ordinarily the Archimedes runs the PC emulator about as fast as a real IBM PC machine. In fact things are not quite as simple as this since certain things run faster and others run slower. In particular the CGA screen display is entirely a software emulation and is thus rather slow (in Archimedes terms) but because of this, it is an ideal candidate for ARM3.

There was a considerable improvement in the speed of the emulator. Screen writing became almost instantaneous and all MS-DOS software I tried ran at an acceptable speed. This was quite important since in the past I have not used various PC packages simply because they were so slow. My estimate is that with ARM3 the emulator runs about as fast as a standard PC/AT. With this increase it makes sense for someone to write VGA and EGA graphics emulations. These were not done with the old emulator simply because it would have been so slow.

Future trials

As yet I have not tested out ARM3 running compiled languages with lots of number crunching. That is, applications which make extensive use of the floating point emulator/coprocessor. Such tests are of particular importance since floating point devotees need to know whether to invest in ARM3 or a floating point coprocessor. Aleph One have promised to loan me an ARM3 unit so that I can carry out more extensive tests. I will then report back with my findings.

Installation

Ordinarily this is not a user-installable upgrade and the price therefore includes collection, fitting and delivery. Since the ARM chip must be removed from its socket, the upgrade can not be fitted to a 3000 machine where the chips are all soldered directly to the board. However both 300 and 400 machines can be fitted, although for optimum use the full 4 Mbytes of RAM are required. Watch out whether 4 Mbyte RAM upgrades for 300 machines also want to use the ARM socket.

The bottom line

The ARM3 upgrade is fully software compatible. It speeded up most of the BASIC programs by about four times. Specially optimised code could, theoretically, run up to about eight times faster and in general with the least suitable programs, an improvement of about two times can be expected. The graphics speed improvement is staggering! However, nobody wants to shell out £595 plus VAT without being sure that the upgrade suits their needs. Consequently, Aleph One will invite potential customers to test out applications before purchase. A

There is a rumour that RISC-OS 2 will have a new version of BASIC – BASIC VI, I suppose – and that it will support full floating point variables which would change the balance of the debate for some people. Also, floating point units are beginning to become available from Acorn. Ed.

NEW RELEASES FROM DABS PRESS

*i*NSTIGATOR

THE ARCHIMEDES SYSTEM MANAGER

Instigator is a powerful utility which adds over eighty new commands to RISC OS, yet occupies only 53k of workspace. Instigator provides you with additional commands for memory management, colour definition, screen display, cut-and-paste, command archiving, disc management, and other general utilities. Instigator is the only '*' command toolkit which allows both desktop and command line operation. From the desktop any command can be selected from a window, with a dialogue box for parameters. The pack contains a disc of demo programs and a 128 page manual. Instigator is written by Mike Ginns, author of the acclaimed *Archimedes Assembly Language* book. Features include:

The commands provided in Instigator:
*Archiver, *Blist, *Border, *CSD, *CSL, *CWindow, *Capture, *Colours, *Compress, *Confirm, *Cut, *Dedit, *DefineMode, *Dfind, *Dget, *Dimmer, *Diss, *Dput, *FSload, *FSsave, *FileC, *Files, *Flash, *FreeMap, *Full, *Goto, *Half, *History, *HourGlass, *ICommands, *IObey, *Istatus, *Keys, *KillModes, *KillPaths, *KillVpals, *LineEdit, *ListModes, *LoadCMOS, *LoadKeys, *LoadOSvars, *LoadPaths, *LoadVpals, *Locate, *Medit, *Mfill, *Mfind, *Mmove, *MouseCols, *OSvars, *OWindow, *Paths, *Percentage, *Printer, *RGB, *Replay, *Return, *SWI, *SaveCMOS, *SaveKeys, *SaveOSvars, *SavePaths, *SaveVpals, *Screen, *ScrollSpeed, *SetPath, *SetVpal, *Smooth, *Tidy, *UnCompress, *UsePath, *UseVpal, *Vpalettes, *WimpCom, *WinCols, *Window, *XCat, *XInfo

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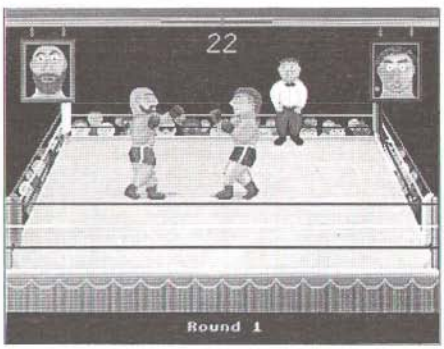

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Instigator and All-In Boxing are available from your local Acorn dealer, or in case of difficulty, direct from Dabs Press (ARO), 5 Victoria Lane, Whitefield, Manchester M25 6AL. Tel. 061-766 8423. Fax. 061-766 8425. Postage free in the UK. Foreign deduct VAT and add £2.50 (surface/Europe), £12 (air). Payment by cheque, Access/MC or Visa.

BASIC V Forum

Clifford Hoggarth

This month we have a couple of minor bugs that have come to light.

First a story about using BASIC V and RISC-OS.

I recently had a letter describing an apparent difference in the action of a semicolon in the PRINT statement. The semicolon is used to inform the PRINT command that the next item should be printed immediately following the previous one e.g.

```
PRINT 123,456
```

gives

```
123 456
```

but

```
PRINT 123;456
```

produces

```
123456
```

Another use of the semicolon is to prevent a line feed at the end of a line. This is especially useful when you want to print in the rightmost column of a given mode without causing the cursor position to move to the next line.

This is were the problem arose. The program concerned used this fact to ensure that consecutive lines of eighty characters could be printed. Under Arthur 1.20 the program worked correctly, however when the program was run under RISC-OS the line feeds became confused and the program would only work if the semicolon in the print statement was **removed**. Try the following two pieces of BASIC to see the difference.

```
FOR count=1 TO 5
PRINT TAB(0,VPOS)STRING$(80,"#");
NEXT
```

and

```
FOR count=1 TO 5
PRINT TAB(0,VPOS)STRING$(80,"#")
NEXT
```

One set will work correctly and the other set will not. One of two different things will have happened though. The incorrect version will either have placed blank lines between the lines of text or all the lines will have been printed on the same line. Now the first is to be expected but not the second. Which effect occurs will depend on whether or not the desktop has been started up since the last hard reset (the result is the same whatever version of BASIC V is used. Note that even if you quit the desktop before running the code, the effect will still be there. Hence the conclusion is that the desktop alters the way in which line feeds occur.

This is not likely to cause many problems, but is extremely difficult to explain. If you experience strange problems with line feeds, bear this in mind. Acorn have, so far, not made any comment.

Formatting with @%

The variable @% has special significance in BBC BASIC, since it is used to format numbers when they are printed. It is best considered as a hexadecimal number...

```
@%=&wwxxyyzz
```

Each pair of digits controls a different aspect of the format:

zz is the field width in characters i.e. how many characters there can be in total, including any padding spaces if required

yy is the accuracy e.g. the number of digits displayed

xx is the format type:

00 is general

01 is scientific notation, i.e. with an exponent

02 is fixed decimal, i.e. always displays a certain number of decimal places

ww affects the function STR$

00 format is ignored by STR$

01 format is taken into account by STR$

For example:

&00000A0A is the default, ten digits in a fieldwidth of ten characters

&00020308 displays the number rounded to 3 decimal places in a column width of eight e.g. PI is 3.142

&0001050A displays numbers in scientific notation corrected to five significant figures in a field ten characters wide e.g. PI is 3.1416E0

Further examples and more details can be found in the BASIC V guide.

The warning...

If the required accuracy cannot be displayed in the requested fieldwidth then the fieldwidth will be ignored in order to maintain the requested accuracy. This can mess up a display when, for example, the columns are being printed using commas to separate each number and the fieldwidth to control column width. Problems are more likely with large numbers, negative numbers and numbers such as 0.01215... where the extra three digits (i.e. "0.0") are needed to maintain the same accuracy.

This is more important when @% is set so that STR$ takes note of it (i.e. @%=&01xxyyzz) as the string length can be larger than expected.

...and the bug.

One minor bug came to light. If you are using scientific notation then BASIC will not correctly handle 0 i.e. zero. For example if @%=&0001050A then the statement

```
PRINT 0
```

will not output the expected 0.0000E0

but the rather odd 00000E0

If this is important the only way I can think of to correct the display is test for zero and then print an appropriate string i.e. PRINT "0.0000E0". A

Chromalock – Video Genlock

Stuart Halliday

This board allows the video output of the Archimedes to be superimposed in full colour on the video signal from an external source like VCR's, video cameras,etc. The Chromalock is a half size 'podule' and came originally with a full length one piece back panel which meant you could not put another podule next to it. This has now been replaced by a two piece back panel. The board comes in two versions; 'amateur' and 'professional'; the only difference, so I am told by G2, is the addition of extra colour filter components which enhance the picture quality and reduce 'dot crawl'. I have seen this professional version at an Acorn stand and can vouch for the better picture quality, but charging an extra £100 for a few extra components strikes me as rather excessive, but I suppose it depends on what the components are!

The hardware

The board's panel holds two BNC sockets; External Video In & Out for standard composite PAL video (no provision for S-VHS) and a RGB input 9 pin D connector. You are supplied with a **very** short 9 pin D type to D type connector cable which connects the computer's RGB output to the board and must remain in place while using the genlock facility. This means that the board must be fitted at the bottom left hand side due to the length of this cable and also means you can not use your Acorn Archimedes monitor at the same time. This is a real pain as you can't even use the mono composite video output from the Arch to your Acorn monitor to see the Archimedes output, as Acorn saved costs by deleting composite video input to the monitor! (Buy the Philips CM8533 monitor instead!) The answer should have been to supply a cable with an extra socket so you could plug in your Acorn monitor but if the genlock card can't take this extra loading on the RGB lines they would have had to add a buffer to the board.

Documentation

The board comes with nine sheets of A4 stapled photo-copied manual and covers very well the installation, use and limitations of the card. Though I thought for £330 I might have got a more glossy manual as the sheets are getting a bit grubby by now.

The board in use

The board can be used in one of two ways and which one you choose must be decided before you fit your card. You have to remove two links from the Archimedes PCB and fit two wires supplied from the card to the pins on the PCB.

First way – No alterations to the card. Only if a colour intensity of 14 or 15 is present somewhere on the screen will **all** colours be overlayed. This is ok if there is at least one colour which is reasonably bright and will cater for 90% of the average users but it means that dark colours cannot be overlayed.

Second Way – Soldering a wire to the Archimedes PCB and cutting a link on the genlock card is required. Now, to overlay any colour requires a little programming from the user. The manual barely covers this aspect and though it does mention the use of the VDU 19 command, the setting of the overlays now require 128 added to the logical and physical colours, e.g. to overlay colour number 3 and changing it to white say, you need to program VDU 19, 3+128, 3+128, &FF, &FF, &FF. No examples are given of this in the manual. The main advantage of all this is that any colour can be overlayed or not, you decide which one.

In actually using the card you must have a good quality first generation video source like an original video camera recording or better still straight from the video camera. The results from making a second generation copy with overlays is very good as long as you realise that the genlock equipment used by the BBC tends to start at £15,000! A timebase correcter fitted in line with the Video In source will guarantee the stability of the final results if your video sources are not prefect, but as these devices start at £800 I've tended to avoid using them!

Software?

There is no 'Video Production' software on the market for the Archimedes and the use of the Archimedes as a caption/graphics device is limited compared with the Commodore Amiga because the Archimedes can not produce a picture that is as wide as the video picture, so that any left or right edge graphics appear several inches from the edge of the TV. The Amiga uses a screen mode called 'Overscan' which allows this and until the Archimedes can do this too, the Amiga will always be better for doing Video Production! *(There are several overscan programs available now on Archive BBS. Ed)*

It's amazing that since buying this board from G2 Systems I've been sent advertisements from G2 of video equipment costing from £25,000! If I could afford those prices I wouldn't have bought a mere £330 genlock. Still it's nice to know they're there for future reference! A

The PC Show – A Brief Summary

Adrian Look

There was so much to see at the PC Show this year, for anyone interested in the Archimedes, that all we can do here is to give you a brief summary of the new products etc and then next month when we've had time to digest the information, we will have a longer report. If anyone else went and discovered any new products, new ideas or whatever, feel free to send in your information on disc (640k) as soon as possible and we will combine it all together for the November magazine.

Acorn were exhibiting their UNIX machine (the R140), the new MEMC1a series machines (the 410/1), and of course the latest addition to the Acorn family (the A3000). The new floating point emulator and Internet (to connect R140's and A400s) were also on display.

Inside the 'Acorn Castle' there was a theatre from which regular seminars were held, 16 in all. These included topics such as: music and graphics, the A400/1, desktop publishing, desktop organisation, SCSI, PipeDream 3, computer maintenance and the Archimedes language.

Elsewhere in the castle, Acorn staff were willing and eager to demonstrate and talk about their machines. The computers were all linked up to central filestores (via Econet), on which there were all sorts of applications and demos. A pre-release version of the RISC-OS First Word Plus could be

seen. This will be available by the end of the year, with a full upgrade path for existing First Word Plus owners. The new product guide was available, but now takes the form of a magazine called 'Acorn Computing'.

The RISC-OS extras disc was available at the show, if you asked nicely. It provides: the new printer drivers (slightly extended versions of the applications that appear on the Acorn DTP disc); a new version of the !65Host which includes sound emulation, limited DFS capabilities, parallel printer emulation and various other extensions/fixes; improved network modules (NetFS, NetPrint, NetFiler and NetStatus); an IRQ latency fix module and new hourglass and sound modules; a WimpUtils module which fixes various obscure bugs in the v2.00 Window Manager; and finally new versions of the Clib (3.50), Colours (0.52) and FPEmulator (2.80) modules. You can get a copy of the disc from your local dealer, which will involve a small admin charge. Alternatively, you can order the disc from us as Shareware 17.

The Acorn Castle was surrounded by its own village. This consisted of various third party stands, which were subsidised by Acorn. All the products and services were Archimedes related and some interesting developments could be seen.

Ace Computing were there demonstrating their RISC- OS version of Euclid and Mogul animator (see review on page 50). Armadillo were demonstrating their A616 (16 bit) sound sampler and the accompanying RISC-OS compatible High Note software. Cadsoft Systems (Calancraft) were displaying two digital electronics CAD packages, 'LogicWorks' and 'DesignWorks', which are being converted from the Mac to the Archimedes. Clares Micro Supplies were one of the main attractions with their new flight simulator 'Interdictor', sound sampling package 'Armadeus', a preview of their DTP 'Tempest' and 16 colour art package 'Artisan2'. Computer Concepts were demonstrating their document processor 'Impression', whose release is 'imminent'. The Data Store were demonstrating some RISCware utilities, which include: OSCLI commands, helping hand, incinerator, make mode, RFS filer, Z88 link and application runner/logger.

EMR (Mike Beecher) were also there, in true tradition. They were showing their Arpeggio Music System which (for those who haven't kept up with Mike) now consists of: SoundSynth and its various Creations discs, HandiMusic1, Scorewriter PMS, VuMusic, RhythmBox, Symphony, Studio24Plus (versions 1 & 2), and MicroStudio. Also available from EMR: 2 port, 32 channel and 4 port, 16 channel MIDI boards; 8 bit sound sampler; SMPTE expansion card and an A3000 tower, which consists of a strong metal stand, monitor plinth, a tower for holding up to 5 single width or 3 full width expansion cards and room for a hard disc, a power supply and a 'handy disk rack'. Granada Microcare were there, showing us the maintainence support that they offer for the Archimedes range. Impact Software (also known as The 4th Dimension) were showing off a pre-release version of their new racing game 'E-Type', based on the £70,000 Jaguar car. Irlam instruments were demonstrating their true 16 grey scale A4 scanner and its accompanying RISC OS software. Linear Graphics were demonstrating their new 2D CAD package 'LinCAD'. Linenuity were showing their SCSI card (watch out for their internal A3000 SCSI card), Presenter II and Presenter Story. All three products should be available for purchase. Oak Computers were demonstrating their Parametric Design Tool (3D CAD package), SCSI hard drives (60Mb and 150Mb tape streamers to follow) and large screen multi-syncs. Pandora Systems were demonstrating their new (RISCware) MIDI sequencer, which will be capable of 256 MIDI channels on 99 reels.

Addresses

CADSoft Systems, 96 High Road, Byfleet, Weybridge, Surrey, KT14 7QT. (09323-42137/8 & 48876)

The Data Store, 6 Chatterton Road, Bromley, Kent. (01-460 8991)

The Fourth Dimension, P.O.Box 4444, Shefield, S3 8AU. (0742-700661)

Irlam Instruments, 133 London Road, Staines, Middlesex, TW18 4HN. (0784-451192)

Linear Graphics Ltd, Unit 39, Mochdre Industrial Estate, Newtown, Powys, SY16 4YE. (0686-629292) A

More Game Writing Techniques

Bjørn Fløtten

First I would like to thank Martin Simmons for discovering that a 10% speed increase was possible in my sprite plotting routine published in Archive 2.10. I would also like to emphasize that my routine (with Martin's improvement) is only in the fast category (I do not dare to call it the fastest anymore!) when you do not want to plot black pixels. If black pixels need to be plotted, a whole new routine must be written, YAIG version 1.40+ has this new routine and I may publish an article about it later.

My shareware game YAIG has slowly evolved over the last year or so, from a crude and hardly playable version in June 1988, to a game with many advanced techniques. I have done many things two or three times, in better and better ways. Looking back at the first version now, I see how much I have learned, and how much time I could have been spared had I known the right techniques beforehand. I will try to explain some of my experiences here.

Steering the aliens in YAIG

Every alien follows a predefined course. In the present version (on Shareware Nº16), there is reserved memory for 64 courses, each of 2048 bytes. My first versions of YAIG were made with crude courses, stored in DATA lines in the BASIC program. The system currently used is much more effective:

If we set a variable 'course_start' to point to the start of a course, we have:

```
course_start!16 = maximum offset
    in the array
course_start!20 = first x-
    position
course_start!24 = first y-
    position
```

From then on, all positions are offsets of the first one. Since there is little distance between every point in a course, I only need **one** byte to describe each position. Compare this to using 4 bytes for each x-position and 4 bytes for each y-position, which is the system you would probably go for first (and which I did!).

In this byte, 4 bits describe the x-offset, and 4 bits the y-offset. Every 4 bit group, called a nibble (anyone remember programming the 6502?) has 3 bits describing the absolute offset, and 1 sign bit. This implies that the maximum x or y distance between each point is 7 pixels (2^3-1). There is no point in using two's complement arithmetic, this simple sign and magnitude system is good enough.

For example, the value 10100011 means a change in y-direction of 1010 and 0011 in x-direction. The leftmost bit is the sign bit, 1 means a negative number. So what we have is a -1 change in the y-position, and 3 in the x-position.

Actually, I could have used only 4 bits per position, having only an increase or decrease of one in each direction.

Extracting the data

If data1R contains the position byte, you can get to the Y value by using the ARM instruction MOV yR,data1R,LSR#4 and the x-value is given by AND xR,data1R,#7

I then continue with the x and y values, for example:

```
CMP yR,#8
ADDMI new_yR,old_yR,yR
ANDPL yR,yR,#7
SUBPL new_yR,old_yR,yR
```

This is only one of many possibilities, I am not looking at the code actually used in YAIG now, you may find that it is totally different. The four instructions operate as follows: (1) Check if yR contains a negative value. (i.e. if yR is greater than 7 and the CMP yields the result "PL" (positive). (2) If the CMP instruction yielded MI, just add up yR. (3) If the CMP instruction yielded PL, the sign bit has to be removed, and then (4) the y-value is subtracted from the old value.

This little piece of code gives good examples of how excellent the ARM processor is. The shift

operators, which can be placed in almost any instruction, together with the conditional execution of every instructions, yields fast programming and fast execution.

Every course array also has some more information. Every attack wave is built up symmetrically, enabling me to effectively halve the number of course arrays needed. With some courses, the aliens are mirrored halfway into the screen, for example: group three of attack wave 1 in YAIG versions before 1.30. Half of the group goes to the left side of the screen and the other half goes to the right side. There is only defined one course, that for the right side (I think). The course contains the position at which half of the aliens can be mirrored, to go to the left side. Mirroring is only done around an y-axis, placed in the middle of the screen.

A course array also contains the coordinates some aliens stick to after reaching it, when entering the screen. For every attack wave, the aliens slowly build up a formation, if you do not shoot them down. All these positions are defined in the course arrays.

All this mean that much of the game can be changed by changing the data. By changing the file 'KURSER' (COURSES) you can build up totally different attack waves.

You may have noticed how the speed of the aliens changes throughout the game. This is easily accomplished, because for every updating of the screen, the course is updated more than one time. At the start of the game, the course is updated 4 times for every screen update, and later it may increase up to 15 times for every screen update. These values are stored in DATA statements, making it easy to modify the difficulty degree of the game.

Using the assembler

You have now also seen a bit of how I allocate register names when programming in assembler. Having 16 registers means that you easily use a new register (with its own name) for every new variable. This quickly leads to code where you have many register names, and where the important registers get lost among all the others. It also becomes difficult to know which register you may use again, for a different variable. Have I finished with that variable yet, or is it used again later in the execution stream? I allocate registers in the following way:

- Important variables, which are used throughout a given section of code, are given a register on their own, with its own name.

- Important variables which are used for only a short time, are sharing a register with one or more other variables, which are not used at the same time. The register is given many different names.

- Intermediate variables are stored in the registers data1R, data2R, data3R and so on. If I want to remember what the value in data1R means at a given time, I use REMarks.

When writing code, this method has the advantages that I generally use few registers and always have the data1R, data2R ... registers available for short term use (2 to 5 instructions).

When looking at a piece of code I have written in this way, I can immediately identify the important variables and see which variables have short time use. In addition, I use **many** REMarks throughout the code. If the code is complicated, it is not unusual for me to have at least one REMark for every ARM-instruction.

A couple of months ago, I had to rewrite the routine for steering the aliens in YAIG, to add some new features. In this routine I had just used a new register for every new value used in the code. All 16 registers were used and I had no idea whether a register was "busy" at a given time in the code. After rewriting the code, putting in lots of comments, and collecting all the intermediate variables into data1R, data2R... registers, I ended up with several free registers! It was impossible to modify the code before the "cleaning", but afterwards it was a joy.

Why do I put an R at the end of every register variable name? The reason is that if you do the assembling and execution in the same program listing, you will almost certainly end up with variables with the same name. I use a system with an R in the end of **every** register name and a P in constants EQUated into the code. You might also find it a good idea to put MC after the name of every label heading a code section and L after all other labels.

Common mistakes

It is easy to make mistakes when programming in BBC BASIC and ARM code which do not give syntax errors. Mistakes which I often make myself are:

```
MOV data1R,#data2R
```

Putting an R after register names helps spot mistakes of this sort, but it still slipped through on YAIG 1.00 on shareware disc 8. Okay, for those of you who did not spot the mistake: what I want is to copy the contents of the register data2R at runtime, into data1R, not the value of the BASIC variable data2R at assembling time.

```
MOV data1R,HPIXELS
```

This is the opposite of the first mistake. Here HPIXELS is a constant value, not a register name, although it is treated as such. Mistakes of this sort may give the "Bad register" error, if HPIXELS is outside the range 0-15, so they may be picked out by the assembler.

Another common mistake I make is to duplicate the definition of a register name: pointerR=0... pointerR=7 and then using pointerR as a parameter to another routine, expecting it to be R0, but it is really 7, since that was the last assignment.

BBC BASIC should have some facilities to help prevent these mistakes, for example, by requiring all register names to have an R tucked at the end. (Roger Wilson, are you listening? When do we get BASIC VI and RISC-OS2?)

It is also a good idea to assemble different parts of your code for themselves, with separate register names, and so on. In YAIG there are something like 20 different ARM-routines, each assembled for itself. The routines communicate with an array called base_tabell (base_array in English). Every routine has its own pointer to this which is EQUated into the code.

Splitting the code into sections means easier maintenance also, but some bugs and other irritating things may occur. An easy mistake to make is to define, for instance, xR = 5 in one assembling procedure and use the registername xR in another assembling procedure forgetting to redefine it to for instance xR = 4. It doesn't help to LOCAL xR in the first procedure, because it will still exist at exit from the procedure, but with a value 0. (This is what I would call a bug in BBC BASIC.)

One of the most annoying thing with the assembler in BBC BASIC is when I have the definition .base_arrayP EQUD base_array placed in two routines, assembled separately, and load the pointer to base_array with a LDR base_arrayR, base_arrayP (see the idea with R's and S's) in both routines. If base_arrayP is defined after the LDR instructions, the assembler will, on the first pass of the assembly of the second routine, try to use the base_arrayP it knows from the second pass of assembly of the first routine. The distance to this point, from the value of the PC (R15) may be such that it gives the "Bad immediate constant" error. I reckon that in such a case, the assembler ought to threat 'base_arrayP' as undefined and make another try at the second pass. Anybody agree?

Hopefully, my experiences, both good and bad, will help you when you want to try to write a machine code game yourself. A

Plane Draft – Structural Analysis

Richard Fallas

Plane Draft from Vision Six Software is a suite of 3 programs which may be purchased separately or, at a total cost of £875 + VAT for the suite. A common menu system and editor link the programs, with output routines (both tabular and graphical) also being shared.

The suite provides a ready means of analysing the three most common forms of 2 dimensional frame considered by a structural engineer. Whilst trusses are soluble by hand (tedious) and some simple redundant frames have been tabulated (e.g. portals and continuous beams), solution of complex frames and virtually any grillage by hand is a mathe-

matically daunting task as this reader has discovered in the course of recent work on bridge decks.

Equipped with a program such as Plane Draft, systems ranging from two span beam, to multi-bay, multi-storey building frames or even skew grillages representing bridge decks may be analysed effectively.

Plane Draft functions with a certain amount of disc accessing between input stages, but using the RAMDISC under RISC-OS speeds things up. This does however reduce the memory available for storing large systems. Currently this is quoted as being of the order of:

A305: 6 supports, bandwidth of 6, 150 nodes and 200 members

A310: 12 supports, bandwidth of 12, 500 nodes and 800 supports

A440: 20 pinned supports, bandwidth of 20, 2000 nodes and 3000 members That's a big frame! (Bandwidth is the maximum difference between member-end numbers on any one member.)

Data Input

Once in the Editor, entry of nodes and members is assisted using the mouse (or keyboard if you prefer) and although "automatic" entry of nodes is not provided (useful for complex frames whose geometry repeats), the mouse/keyboard environment of the Archimedes is very effective.

Next, member properties must be input, together with support conditions. Plane Draft offers a comprehensive choice of support types and, importantly, will offer analysis with "sinking supports". However, support stiffnesses cannot at present be varied to values other than "free" and "rigid". Loads are then applied to the model, and the analysis performed. Speed of analysis seems subjectively quite fast, although meaningful tests could not be carried out due to the node limitations of the review version of the program.

Ouput

I very much liked the graphical output, which includes bending moments, reaction forces and deflections as required.

Solution of such systems is essentially a manipulation of stiffness matrices, representing the members, forces and deflections. A global stiffness matrix is assembled and solved using a process such as the Gaussian solution, of the resulting banded matrix. Member end forces are then calculated from the deflections which this solution provides.

The maths for this process as a whole is, if somewhat tortuous, at least fairly well established. The clever bit comes in making the process accessible and convenient to the user in terms of input and output.

How good is it?

Just how well Vision Six have implemented these aspects won't become fully apparent until I have had more chance to test the product thoroughly. Initial impressions have been mixed but many of my problems have been no doubt due to lack of familiarity. Editing provision seems good as does the graphical output. Input user friendliness is not so good and the manual often less than helpful.

Areas for improvement in the program which I personally would look for are as follows:

- a more comprehensive manual with more diagramatic explanations e.g. of load and support types.
- multiple load cases processed simultaneously.
- more comprehensive load case handling facilities enabling load factors to be applied to basic cases and combinations output.
- variable stiffness supports.
- refinements to node input to speed up "repeat" entry.
- provision for input of Poissons Ratio and of Torsional constant, C, for each member.
- cataloguing disc files should be permitted while in use.

I was pleased to see Plane Draft appear in Archive as it represents an area of application hitherto unsupported for Archimedes users, with the exception of Oaks PDT CAD package.

Having written my own Frame Analysis program, I can appreciate the cumulative effort that has gone

into Plane Draft by its various authors, to make it applicable to all three types of analysis.

The opposition

Comparable products in the PC world are however somewhat more refined, offering facilities generally to speed up data entry, but also in the "post-processing" field, such as the "Wood-Armer" treatment of torsions. A typical package of this type, "STRAP", costs £1400 for the 2D version and has Department of Transport acceptance under their calibration scheme. (Incidentally I have recently researched and written routines to perform "Wood-Armer" transformations if Vision-Six are interested in including this post-processing option).

Vision-Six have undoubtedly got some way to go to reach this degree of sophistication but have made a welcome start on the road to acceptance by practising engineers. Compared with an Archimedes program such as PDT at £295, Plane Draft's £875 seems over-priced. Good software should not be cheap, or it will fail to gain acceptance. However I would hesitate to buy the package at its rather high, current price.

A clear statement from Vision-Six on their upgrading policy would be helpful to prospective purchasers. Meanwhile if you are interested, get hold of a demonstration disc and see how well Plane Draft suits your needs. A

Clares' Arcade 3

Chris Furlong

The games on this disc are:

Zarkon Invasion, Mazey Man, Bounce-a-Ball

I will mention all of these games separately, but first some general comments about the disc. The review disc would not boot from the RISC-OS desktop, Clares are advertising the production version as RISC-OS compatible so I presume this has been corrected. It looks as if the program re-configures the machine to its own requirements but does retain the original settings. All of the games use the internal sound modules, so don't expect great sound effects. The disc is also copy protected (none too well – just a few trashed sectors here and there making it easy to copy with the simplest of Shareware disc copiers).

When the disc is booted you are presented with a scrolling Clares logo with a brief description of the games below it, clicking a mouse button stops this title page and causes the main menu to be loaded.

The main menu is not that impressive, just allowing mouse selection of the games. All of the games can be played using the mouse or keyboard.

Zarkon Invasion

This is a zap-the-aliens game comparable to Galaforce on the Beeb. It uses big, chunky, well-animated sprites and is relatively hard to play (using the keyboard is easier). Each wave has the same alien following different patterns, and each level is faster than the previous one. More than one type of alien would have enhanced the game.

Mazey Man

As the name suggests this is a form of PACMAN game. The graphics are good, with well-animated ghosts and Pacman. I found the mouse control made the game harder to play. The game starts out very slowly but soon speeds up. This is a good implementation of a classic game.

Bounce-a-Ball

This a classic bat-and-ball game. It seems quite hard, possibly because the next ball is fired straight after you lose the previous one – you have no time to position the bat. It's quite good if you like that sort of thing.

So is the package worth £14? Yes if you want something for the kids to play, or you are a person who likes playing games. I quite enjoyed it but would have expected slightly better from Clares when you look at the other much more profeesional looking software they produce. A

Ibix The Viking

Richard Foster

Ibix the Viking is the latest offering from Minerva to the Archimedes games world. In this arcade adventure (a cross between Repton and Citadel) you take the part of Ibix, a Viking, whose quest is simply to journey through eight levels collecting treasure as he goes. This is all to satisfy the whims of a princess whom Ibix aims to rescue.

Once the disc is booted, you are greeted by a nonchalant loading page with an attractive logo prompting you to change the keys. Once past this stage, the disc spends a while loading, though whether this is due to the amount of data or their copy protection I am not sure. Eventually you find yourself at a menu accompanied by faint music in the background.

The games sound is, to say the least, weird. Throughout the whole game a tune plays in the background. Initially the sound seems far too quiet but it has the bonus that after several hours of playing it does not become too annoying. This quiet sound affects the internal speaker but if you have your Archimedes connected up to some decent speakers, the sound should be improved. The myriad of other sound effects are slightly more interesting. I expected to hear pleasant ringing as treasure is collected or a sliding noise as rocks fall. I did not expect half the sampled music. These short samples are mostly excellent though how they fit in is a mystery. The variety of sounds and voices in Ibix is the subject of a competition by Minerva. Recognise them and you could win £50 worth of Minerva software.

The game itself is a mixture of quick reactions and puzzle solving. Ibix wanders around each level collecting treasures, shooting enemies, collecting objects and moving obstacles. These objects have varied effects from opening coloured doors to enabling Ibix to move otherwise immobile objects. Sixteen levels are supplied, eight easy and eight hard. I managed to solve the easy levels in a few goes. These offer a good chance to find out what various objects do as the instructions for this part of the game are sparse. Once you feel confident enough you can load in the harder levels. These levels offer much more of a challenge. Another feature is also introduced, that of passwords. You can start on any of the easy levels but for a hard level you must have solved its preceding level. I have managed about half of these levels. Some impossibly fast portcullises prevented my passage through one level, and a puzzle which initially seemed to be impossible, on another.

The graphics and animation in the game are excellent. The sprites, though a little small are excellently detailed and there is a wide variety of them though I failed to notice any viking ships. My favourite piece of animation is when <P> is pressed to pause the game. Everything stops except the previously inanimate helmet Ibix wears, which takes it upon itself to spin round.

The editor

So what else do you get apart from a challenging game and some superb samples I hear you ask? Included in the package is an extensive editor. Not only does it let you define the map and design characters and scenery, but it also allows you to govern the way everything behaves. Here the game really excels by making everything extremely easy (more so than other games I could mention). Perhaps the only quibble is the lack of features for sprite designing. Up to 243 objects and 54 enemies can be defined and designed, so you can easily add new ideas.

Overall, Ibix the Viking is well worth adding to your games collection. It has a nice balance between speed and puzzles and a certain addictive quality about it. The only annoying feature is the copy-protection.

Ibix the Viking costs £19.95 from Minerva or £19 from Archive. A

Spark – RISC-OS File Compressor

Alan Glover

Spark (£5.99 by post from David Pilling) is a development of the Archimedes 'Arc' program. So, before progressing to the advantages offered by Spark let us take a look at Arc.

Arc File Compressor

Arc is a program intended for archiving and recovering files. It can put a number of files into one file, and will compact/crunch the files. It can achieve some impressive savings – around 50% on text files and often much more with files such as sprites or screendumps. Although intended originally as an archiving aid, it has found a secondary use – as a means of linking files together on bulletin boards so that users can download all the files for a particular program in one file, with the benefits of file compaction too. Arc is 'public domain', i.e. it is freely distributed and appears on a number of discs and virtually all Archimedes bulletin boards.

Arc does have a number of problems though: it does not easily handle directories, and is only controllable by a *command with a vast number of possible parameters.

Arc to Spark

Spark has been written by David Pilling, who converted the Arc program, to rectify these and a number of other shortcomings in the original program. It differs from Arc in that it runs in the RISC-OS desktop. Once loaded, it installs itself onto the icon bar. Henceforth double-clicking on a file with the 'ark' icon (filetype &DDC – used by Arc V1.2 as well), or dragging any file to the icon, will open up a window on screen showing the files in the archive. This is in a display just like the normal filer window. In fact, wherever possible, it behaves just like a filer window, such as ADFS or RAMFS.

Directories can be handled by Spark too. Files and directories can be dragged into and out of a Spark window, almost as if compaction/archiving were not involved. The practical effect of this is that to access a file in an archive you do not need to unpack the whole archive. Thus you could have well over 1 Mbyte of data on a disc and simply access whichever files you need. This should lead to impressive space savings on things like pictures/ line art for use with the ever increasing number of DTP packages for the Archimedes.

Despite the vastly easier to use interface, none of the power has been lost and all the options of the old Arc are still there, accessible by means of menus from the file window or the icon.

I have been using Spark for some time now preparing and testing files for the Archive Bulletin Board. I find that its ability to handle directories is worth the package alone (one of the things I least enjoyed [and most often messed up] was flattening out directory structures to prepare files for the board). It has one or two quirks, some of which are inherited from Arc but these are soon discovered and avoided.

Incidentally Spark and Arc files are inter-changeable. A multi-directory archive made with Spark can be decoded with Arc, but it must be invoked for every directory. You may also get crc warnings when using Arc on Spark images – these should be ignored.

More for your money

However, there is even more on the Spark disc. There is another non-pd program called Backdrop. This allows you to leave a file or directory anywhere on the background of the desktop (like TinyDirs) but you can leave files anywhere on the screen.

There are also a number of public domain programs included. The first is a 'Dustbin' program. This allows you to delete files by moving them into the dustbin, whereupon the bin bulges. You may then either drag the files back into a directory or empty the bin, which deletes the file.

'Format' is a background disc formatter for ADFS discs. It multi-tasks with other applications (although it does take a fair bit of processor time).

I have even used it to format discs in two different drives simultaneously!

'Wander' (or should it be "Wanda?') is one version of the now (in)famous RISC-OS desktop fish program – a number of fish appear behind a window, whose presence is only betrayed by a stream of bubbles rising from behind the window! – Great fun and quite harmless. A

Using the Armadillo Sound Sampler

Stuart Halliday

Armadillo produce three sound sampler boards for the Archimedes; A448-m a professional 16-bit CD quality podule, A448-b a stereo 8-bit podule and their original board the A448 mono 8-bit sampler. I bought the mono version in August 1988 as it is the most popular of the three (and it was the cheapest!).

The board arrived in the post and immediately I discovered the board would not fit on to my 4 way backplane as I already had three podules installed and the board was fitted with a full length bracket instead of two half size pieces. A quick phone call to my supplier and I received the necessary bits of metal and had them fitted in no time. I suggest whenever you order any podule, you ask if a two piece bracket is fitted first.

Once in place, the on-board ROM loads a module called 'sampler'. This module controls the board but it also means that any samples you create can not be played on another Archimedes as it needs the ROM. Using the application disc supplied, you can transform these samples to voice modules, which can be used in any Archimedes.

Documentation

The manual supplied is not complete. It leaves you without some essential information on how to run your samples from BASIC. For example, I had to phone up to find out that to play the voice modules using the SOUND command, you have to type in a pitch value of 200000 +–256. This lack of information meant that I thought voice modules were no use. The last update I've received was in October '88 and dated 18th April 1988 and even that was not accurate!

The main software is run by doing a <ctrl-break> and is only Arthur compatible. This program has many bugs, the least of which is that the display is untidy when selecting files. The worst bug must be when your disc is almost full, and when you try and save another sample, the program throws up a message saying you have a full disc but actually leaves the disc with an unfinished 'open' file which needs to be 'closed' and then deleted manually.

The method of selecting the time limit of a sample to be made is very slow and if you have selected too long a sample time and there is not enough memory to store this attempt, you have to re-enter all the name, sample frequency and length information again. This can be very frustrating.

The markers you use to indicate the start and finish of a section you wish to edit tend to become 'sticky' at the edges of the box displaying the waveform and even sometimes swaps over with marker 1 changing to marker 2 for some reason. There are a few other lesser bugs which I won't bother to explain.

I suppose the main fault I find in using the software is that if the end value of a sample is not at zero, you get a loud click as the speaker comes to rest. The only way I've found to get over this is to add a zero level sample at the end and edit backwards until a zero level is found.

The sound samples can be of a very high quality up to a sampling rate of 41.6 kHz down to a poor 4.62 kHz. The demo sounds supplied are best described as pathetic and don't do justice to the board's capabilities. In the end, the quality of the samples are ultimately limited by the Archimedes loudspeaker and the background noise that the computer produces, but that is why Armadillo also sells a £1200 professional unit for serious users!

I did write to Armadillo in January 1989 about the bugs and requested details on the data format used as the booklet indicated on page 25 but I never got any reply from them.

Recently I got RISC-OS and the board would not work, so I phoned Armadillo to ask if a RISC-OS update was to be made available and got a very unhelpful reply. There is to be no RISC-OS update for the mono version but the stereo version gets one and to run the sampler under RISC-OS I was told to remove the Archimedes SOUNDDMA module before booting up.

I've since written an update for the sampler ADIT program so that several of the serious bugs are removed. These changes are listed below. Basically, Armadillo really need to improve their program a lot!

```
*BASIC
LOAD"$.RESOURCES.ADIT.ADIT"
*ACCESS $.RESOURCES.ADIT.ADIT WR
*RENAME $.RESOURCES.ADIT.ADIT
$.RESOURCES.ADIT.AditORIGIN
 65 REM UPDATE 25/7/89 BY Stuart
                              Halliday
 72 PROCfindcurrentdrive
 73 c_d1%=c_d%:c_d1$=
        "floppy drive :"+STR$c_d1%
 74 *DIR $
310 WHEN 0 : PROCTitle
                    ("SelectEntry")
                  : PROCSelectEntry
320 WHEN 1 : PROCTitle("LoadAFile")
                    : PROCLoadAFile
330 WHEN 2 : PROCTitle
                    ("ChangeSpeed")
                  : PROCChangeSpeed
340 WHEN 16: PROCPlayPortion
350 WHEN 4 : PROCTitle("Normalise")
              :FOR Z=1 TO 1E4:NEXT
                   :PROCNormalise
360 WHEN 5 : PROCTitle("NewVolume")
                    : PROCNewVolume
370 WHEN 6 : PROCTitle("SaveAFile")
                    : PROCSaveAFile
380 WHEN 7:PROCTitle("RenameEntry")
                  : PROCRenameEntry
390 WHEN 8 : PROCTitle
                    ("ArthurPrompt")
                  : PROCArthurPrompt
400 WHEN 9 :PROCTitle("GainSample")
                    : PROCGainSample
410 WHEN 10 : PROCTitle
       ("Reverse") : PROCReverse
420 WHEN 11 : PROCTitle("Delete")
                    : PROCDelete
430 WHEN 12 : PROCTitle("Insert")
                    : PROCInsert
440 WHEN 13 : PROCTitle
         ("PROCCopy") : PROCCopy
450 WHEN 14 : PROCTitle
                  ("MergeSamples")
                : PROCMergeSamples
460 WHEN 17 : PROCStopPlaying
470 WHEN 3  : PROCTitle
       ("Sampler") : PROCSampler
480 WHEN 15 : PROCEcho
490 WHEN 18 : PROCScrollLeft
500 WHEN 19 : PROCScrollRight
510 WHEN 20 : PROCTitle("Mark1")
                    : PROCMark1
520 WHEN 21 : PROCTitle("Insert")
                    : PROCInsertNull
530 WHEN 22 : PROCTitle
                  ("RemoveSample")
                : PROCRemoveEntry
540 WHEN 23 : PROCNewScale
550 WHEN 24 : PROCTitle("Mark2")
                    : PROCMark2
575 WHEN 27 : PROCchangedrive
665 PROCtrap_errors
1005 PROCAddBox2("Drive_"+STR$c_d%
                    ,572,960-128)
1135 OSCLI"DRIVE "+STR$c_d1%
                          :*MOUNT
3440 WAIT : LINE ScrL+P%,ScrB,ScrL
                    +P%,ScrB+512
3445 LINE ScrL+P%-4,ScrB+260,ScrL
      +P%+4,ScrB+260:GCOL0,Fore1
7295 OSCLI"MOUNT"
7305 PROCDrawGraph
7605 PROCDrawGraph
14060 DEFPROCtrap_errors
14070 err=&0000FF AND ERR
14080 CASE err OF
14090 WHEN &BD OR &C3 :
   PROCunlockfile: REM FILE LOCKED
14100 WHEN &9A :PROCchangedisc("The
              disc in "+c_d$+" is
                    not ADFS!")
```

```
14110 WHEN &A9 OR &A8
       :PROCchangedisc("The disc is
             damaged in some way.")
14120 WHEN &B3 :PROCchangedisc("The
       current directory is full.")
14130 WHEN &C6 : PROCnewdisc : REM
                          DISC FULL
14140 WHEN &D3 : PROCMSG(c_d$+" is
              empty place a disc in
                       it!"):A$=GET$
14145 WHEN &D6 : PROCMSG("The
      Master disc is missing, place
        it in "+c_d1$+"press 'SPACE
                KEY' to continue.")
                    :A$=GET$:*MOUNT
14150 WHEN &99 OR &98
                     PROCcompactdisc
14160 WHEN &C9 : PROCMSG("Take the
          WRITE PROTECT TAB off the
         disc, press 'SPACE KEY' to
            continue."):A$=GET$:REM
            WRITE PROTECT TAB IS ON
14170 ENDCASE
14180 ENDPROC
14190 :
14210 DEFPROCnewdisc
14220 CLOSE#H%:OSCLI"DELETE "+N$
14230 PROCchangedisc("This disc is
                              full.")
14240 ENDPROC
14250 :
14260 DEFPROCchangedisc(A$)
14270 PROCMSG(A$+"Do you wish to
                        change it?")
14280 A$=GET$
14290 IF A$="Y" OR A$="y" THEN
14300   PROCMSG("Insert new disc in
          "+c_d$+" and press 'SPACE
                KEY' to continue.")
14310   A$=GET$
14320   PROCMSG("IF YOU WISH TO
             FORMAT THIS DISC PRESS
        '#' KEY OTHERWISE ANY KEY")
14330   A$=GET$
14340   PROCClear(0)
14350 ENDIF
14360 IF A$="#" OSCLI"FORMAT "+
                     STR$c_d%+" D Y"
14370 *MOUNT
14380 ENDPROC
14390 :
14400 DEFPROCcompactdisc
14410 PROCMSG("COMPACTING DISC")
14420 $scratch=STR$c_d%+CHR$0
14430 REPEAT
14440   SYS"ADFS_FreeSpace",scratch
                              TO R0,R1
14450   *COMPACT
14460 UNTIL R0=R1
14470 ENDPROC
14480 :
14490 DEFPROCunlockfile
14500 PROCMSG("THIS FILE IS LOCKED,
                 UNLOCKING FILE...")
14510 X$=INKEY$(100)
14520 OSCLI("ACCESS "+N$+" WR")
14530 PROCMSG("FILE IS UNLOCKED.
                 TRY RE-SAVING IT!")
                     :X$=INKEY$(200)
14540 ENDPROC
14550 :
14560 DEFPROCfindcurrentdrive
14570 SYS"ADFS_Drives" TO c_d%,
                           mx_f%,mx_h%
14580 IF c_d%<4 THEN c_d$="floppy
        drive :"+STR$c_d% ELSE c_d$
           ="hard drive :"+STR$c_d%
14590 mx_d%=mx_f%-1
14600 ENDPROC
14610 :
14620 DEFPROCselectdrive(c_d%)
14630 OSCLI"DRIVE "+STR$c_d%
14640 *MOUNT
14650 ENDPROC
14660 :
14670 DEFPROCchangedrive
14680 c_d% +=1
14690 IF c_d%>mx_d% LET c_d%=0
14700 IF c_d%<4 LET c_d$="floppy
        drive :"+STR$c_d% ELSE c_d$
           ="hard drive :"+STR$c_d%
14710 B$(27)="Drive_"+STR$c_d%
14720 PROCDrawBoxes2(27)
14730 OSCLI"DRIVE "+STR$c_d%
14740 PROCClearPendingMouse
14750 ENDPROC
SAVE"$.RESOURCES.ADIT.ADIT" A
```

RISC-OS Euclid & Mogul

Malcolm Banthorpe

Euclid is an object-orientated 3D graphics editor in the same way that Acorn's !DRAW is a 2D graphics editor. 3D objects may be created and stored separately and subsequently combined as required to create new scenes. When objects have been combined in this way, they may still be manipulated and modified separately if required.

Scenes can be displayed in a number of styles:

wireframe – lit or unlit; multiple light sources are possible; faces only or faces and edges; monochrome or colour.

The original version of Euclid was reviewed by Brian O'Carroll in Archive 1.10. Last autumn an upgraded version offering a number of enhancements was made available to existing users at no extra cost. Now an extensively upgraded RISC-OS version is available at a cost of £15 to registered users or £70 to new users. The major difference in the new version, as might be expected, is that it is multi-tasking but there are several other changes and improvements which will be described below. Those who have already been using Euclid for some time will be relieved to hear that existing data files are compatible with the new version.

The application is supplied on a single unprotected disc and comes with a 38 page manual. As with the original version, the heart of Euclid is a relocatable module which performs the actual 3D perspective transformations and hidden-line removal, the editor and most of the other programs on the disc one written in BASIC.

Scenes and objects are organised within data files in a hierarchical manner similar to the way in which ADFS organises files and directories; the root object is even called $. This makes it easy to maintain a library of objects and component parts of objects from which new objects and complete scenes can be built up.

Up to nine "cameras" may be placed within a scene to give different perspective views. The angle of view of each may be changed to give the effect of viewing the scene through lenses of different focal lengths.

Using the RISC-OS version

Clicking on the Euclid application icon in a directory viewer installs Euclid on the desktop icon bar. Clicking on this will open a new Euclid file window (similar to the sprite file windows used with !PAINT), containing only an empty $ object, allowing a new scene to be created. Alternatively, you can click on an existing file or drag it onto the icon bar.

The editing window is similar in appearance to that of the !DRAW application, with an optional toolbox at the left-hand side. Individual objects within the window are marked by blue blobs. Clicking once on the blob selects that object and allows it to be dragged to a new position or scaled or rotated. Double-clicking takes you a step down the hierarchy and gives access to the component parts of the object. If this description seems complicated, don't be put off: in practice it provides a highly intuitive way of dealing with complex objects and scenes with many different components. As with !DRAW a number of individually created objects can be grouped so that, for instance, they can all be moved or scaled together.

Creating objects

Individual objects are created, as in the original Euclid, by means of lines, circles and polygons. Bezier curves are now also available to aid the construction of curved surfaces. The planes in which these surfaces are placed will depend on which view has been selected for the window in which they are placed: front, left, top, isometric etc. In the case of the isometric view, the active pair of axes can be toggled to allow drawing and movement in the required plane. The axes may also be toggled in other views, though this is of more limited use.

More than one view can be placed on the screen at any time by opening additional view windows. In addition, spheres, cubes and cylinders are now available on the toolbox as primitives to save time in object creation.

Meshes (formerly called 'landscapes' in the old Euclid) and Sheets allow more complex shapes to be built up. As the manual points out, by far the best way to become familiar with the editor is to load one of the many example files supplied on the disc and then try the effect of various options to modify them. I found this particularly so with the options on the new topology menu – they are almost impossible to describe adequately in words but a little experimentation makes clear their effects.

Freehand drawing to construct a surface, either with straight lines or with curves again has similarities with !DRAW. The same 'winding rules' are employed so that, for instance, it is possible to construct a rectangular facet containing a window as a single surface. Previously it would have been necessary to construct it as two or more separate surfaces.

Any screen mode may be used, although modes 12 and 15 will be the most useful (at least with a standard non-multisync monitor). Mode 15 is naturally the best for displaying the maximum range of shades in a lit scene but if memory is tight then the mode 12 display makes a good attempt at representing the full range by employing dithered colours.

Printout

Screen dumping to a printer is possible if a suitable Acorn printer driver has been installed. A far better print-out is made possible by saving a scene as a !DRAW file. This where the multi-tasking comes in handy, in that a !DRAW window can simultaneously be open. The print resolution is then not limited by that of the screen but only by the printer. When this option is employed, the Painter's Algorithm is used to save each surface as an individual !DRAW object. Because of this, perfect hidden line removal is not achieved where concave surfaces and intersecting surfaces are involved, but the resulting file can generally be edited in !DRAW to give a satisfactory result.

Importing !Draw files

The reverse process is also available so that 2D !DRAW files can be imported into Euclid and extruded into 3D objects. An easy way to create 3D lettering is to trace the outline of text typed into !DRAW and then to import the resulting file.

Amongst the other notable changes, it is now much easier to apply measurements to objects or to measure the dimensions of an object that has been created freehand so that new objects can be accurately matched to it.

Programming aspects

The above concentrates on describing the editor as that is the way in which most people are likely to use Euclid. However, as mentioned earlier, at its heart is a relocatable module. All of its functions are available via SWI's which are described in detail, together with the data structure, in a text files on the disc. This means that more ambitious users can take full advantage of Euclid's high speed 3D data processing to create their own applications. The disc contains a number of demonstration programs which could profitably be studied if you wish to use Euclid in this way. One program, written in BASIC and called "Crasher", is very similar to "Lander" and demonstrates the power of the module very effectively.

Mogul

Mogul is available separately as an attachment to Euclid for £20 and allows simple animated sequences to be generated. For instance, you could choose the view from one of the cameras and then move the camera to give a 'fly around' or 'walk through' the scene. Alternatively, or at the same time, objects within the scene can be individually moved. Complex moves are fairly easy to create by just indicating the key positions and indicating the number of frames it should take to move between them. An example of a typical animation appears on the RISC-OS support disc, in the Ace Computing directory. The limiting factor on how long an animation can be created is imposed by how much memory you have available – less memory is required if you choose a small window size. On a 1 megabyte machine, depending on the scene content

and the screen mode chosen, there may be room for 150 frames (lasting about 6 seconds) of a quarter screen window. Two types of data compression are available. Which one makes best use of available memory will again be dependent on the scene content and will need initially to be determined by trial and error.

Conclusion

Euclid was one of the first major pieces of Archimedes software to appear and to my mind remains among the best. The RISC-OS version makes good use of the new operating system and incorporates a number of changes to aid the creation of scenes. Some long-time users, having got used to the old version, may feel that some of the new features are a step in the wrong direction or could be further improved. Tony Cheal of Ace Computing would welcome any such comments so that they can be reflected in future releases. Personally, having used RISC-OS Euclid for a couple of months, I wouldn't wish to return to the old version, though I had become so accustomed to using the old version that it took a couple of weeks to get used to it. New versions will generally be available at nominal cost to registered users. A possible 'pro' version is also planned which would include ray-tracing. A

Avon Calling?

Martin Percival

Having heard many good reviews of Topologika software written for the BBC Micro, I sought them out at the Acorn User Show and came away with a copy of AVON, a "Shakespearian" adventure for the Archimedes. Although the disc contains two adventures (the second being The Monsters of Murdac), I have only had time to have a look at Avon, so please bear this in mind as you read on.

All you hard disc owners out there will have to reconfigure your machine to boot from drive 0, since simply changing your current directory and executing the code only seems to get part of the way to starting the application. Once this little hurdle is overcome, the title screen appears immediately, showing the back of the postcard which is included in the package.

Sorry, graphics are off!

If you have become used to the new "graphic" approach to adventuring, then Avon will come as a bit of a shock, since after the first screen you will be plunged back into the purist "text-only" world. The layout of the screen is very reminiscent of many of the Infocom adventures, but location descriptions tend to be quite short, being really only places where things happen or objects are found. Having said that, the text is often very witty and although 'no knowledge of Shakespeare is required', many comments slipped into the game become more intelligible (and seem even more clever) when you recognise a character or situation.

The characters met in the game are the kind that will supply objects or will interact with you in a fairly basic way. So, for example, if you can't get off Cleopatra's barge, all you have to do is asp her nicely and all will be well!

I found myself frustrated several times by the parser, despite all attempts to be gentle with it. For example, it will recognise "all" as a kind of noun, so GET ALL works well. You can also PUT <object> IN <container>. However, any attempt to PUT ALL IN <container> met with failure. Abbreviations exist, but they may have to be found by trial and error, e.g. 'INV' is short for inventory, not the more common 'I', and other words may have to use more than three letters.

These however are only cosmetic features. Once you start playing, the game has the kind of appeal that will draw you back in to it "just to see what will happen next." I particularly liked the way that the game changes, as the date changes internally, since this adds a new element to the problem solving required. I was less impressed by the source of light, that you will (as in all adventures) need eventually. However, if you keep your eye peeled, you should get round that fairly early on. This seemed to be the

only arbitrary decision to make in the game, albeit one with a kind of strange logic to it. Everything else fits together neatly, and as I have already mentioned, the atmosphere is excellent, with everyone from "The Merchant of Venice" to the witches from "Macbeth" having a role to play.

Overall, I would recommend Avon, provided you note the comments above. My own knowledge of the Bard is limited, so I can guarantee that (so far) I have not had to have a copy of "The Collected Works" by my monitor. However, as a parting comment, "Beware the Ides of March". A

RISC-OS Reference Manuals

Adrian Look

Acorn have finally released the RISC-OS Programmer's Reference Manuals (PRMs). The £79.95 kit (£75 to Archive members) consists of four volumes, a separate index and a storage box. It totals 1885 pages and weighs over 4.2 kgs!

The manuals are split up into seven sections, the headings are as follows: Introduction, The kernel, Filing systems, The window manager, System extensions, Appendices and Tables.

The first section introduces you to RISC-OS, the basic concepts behind it and the Archimedes hardware. The second section describes the central core (kernel) of the operating system and covers: character output, VDU drivers, sprites, character input, time and date, conversions, the command line interpreter, modules, the program environment, memory management and the few remaining kernel commands e.g. IIC devices, CRC checks, etc. The third section describes the Acorn implementations of the ADFS, RamFS, NetFS, NetPrint, DeskFS and the system devices. It also explains how to write your own filing systems at both the FileCore (ADFS type filing system) and the FileSwitch (any filing system) levels. The fourth section comprehensively covers the window manager commands. This includes all the window and menu facilities as well as multi-tasking and messaging. The fifth section covers the remaining 'system extension' modules, these are as follows: Econet and NetStatus, the hourglass, colour translation, anti-aliased fonts, the draw module (which provides Postscript based graphics paths as used in !Draw), printer drivers – explaining how to access them and how to write your own, the sound systems – including WaveSynth, expansion card (podules), the international module which deals with the keyboard and system font handling, the debugger, floating point emulation and how to provide a 'shell' command line interpreter. The sixth section provides various appendices on the ARM assembler, linker, procedure call standard, ARM object file format and other file formats e.g. sprites, templates, fonts, etc. The seventh and final section provides a host of table which can be used for reference: VDU codes, modes, file types, character sets, SWIs, OS_Word calls, OS_Byte calls, *commands and of course the 15 page index.

The manuals offer in-depth information on RISC-OS – the sheer quantity of information is quite daunting and the fact that the manuals have a new layout means that, at first, it is difficult to know where to look. However, once you have browsed through the tomes a couple of times you will become familiar with its layout and format.

The text is definitely programmer orientated – if you are struggling to write BASIC programs then this manual is **not** suitable for you. The manuals try to cover topics so that they include: an introduction, an overview, technical details (to be used as reference once you have read the overview), SWI calls, *commands, application notes (to help your write your own programs) and occasionally example programs.

In conclusion, you should think carefully before buying these manuals. The information contained is very technical and unless you are capable of digesting such material you would be advised to spend your well earned pennies elsewhere. For serious programmers, however, these manuals are essential and well worth the asking price. A

Language Forum

David Wild

Three items this month: discussion about language documentation, information about the forthcoming Release 3 of Acornsoft C and finally a suggestion about puting large numbers of parameters into a Pascal command line.

Language documentation

Recently a reader wrote to me about a language problem and in his letter he complained about the documentation with the compiler for 'C'. He added that Acorn seem to think that all the users of their compiled languages are experts, and compared the manual unfavourably with that for BASIC.

While I can understand his frustration when he is not familiar with the language, I think that it is wrong to expect the compiler writer to teach us to use the language. If we buy a car we do not expect the handbook to tell us how to drive, but expect that we shall need to take lessons if we have not already done so. We do, however, expect the handbook to tell us the function of each of the knobs, levers and switches provided. A valid criticism of many computer manuals is that they do not do this and leave us to find out by trial and error. This is especially important when many extensions have been provided, as in the case of ISO-Pascal.

We all tend to underestimate the amount of work involved in learning a computer language – including BASIC. BASIC itself tends to compound the problem because of its interactive nature. This allows us to "bodge" almost any sequence of statements so that they work, even though it may be a very poor program in terms of efficiency and maintainability. For many years, magazines have been full of listings which showed examples of bad programming, often because the idea behind the program was good. One contributor to A&B Computing, for instance, regularly had programs which included extracts like:-

```
100 IF A = 10 GOTO 180
110 GOTO 120
120 LET B = 5
```

The inclusion of line 110 suggests that he didn't really understand the way in which a BASIC program works, apart from any objection to the use of the GOTO statement.

It is always very tempting, especially if you already know one language, to think that with a few more instructions in the book you are ready to begin writing programs in another language. One of the big problems with this is that you find yourself writing in the new language with the constructions of the old, and this applies even to BBC BASIC for those who were brought up on older versions. Archive disk 12 includes 31 astronomy programs which illustrate the point beautifully – as you read them it is obvious that they have been converted from another BASIC and their control structure ignores BBC BASIC completely.

Another problem with expecting the language manual to teach you how to use the language is that different people have different learning needs. I, for instance, started to learn Pascal at home on my BBC machine. Because of this I had no problems in finding machine time as the machine was free if I was, but I had no one to consult as soon as I ran into a problem. This meant that I needed lots of worked examples so that I could become familiar with the way in which the language worked. On the other hand my son took up Pascal at university where help, both from tutors and other students was always available, but machine time could be very scarce. The book I used would have been much less useful for him – and I would have found his textbook far too terse.

The solution, therefore, is to treat learning a new computer language in the same way as learning a new spoken language and expect to give it the same sort of effort. If you cannot have formal tuition, go and look at the books which are available for your chosen language and pick one that best meets your circumstances. When you have bought it work through it systematically and do all the exercises! If you can, try reading programs written by other

people – and work out why they used the particular methods, and whether they could have done it better.

The books I would recommend for Pascal are "Oh! Pascal!" by Cooper and Clancy, and "Standard Pascal" by Victor J Law. (Do not confuse this latter book, which is not as easy to get because the publishers do not have an English distributor, with a book of the same name by Cooper.) It would be very helpful if those of you who use 'C' and Fortran would let me have similar recommendations. There are many boring and uninformative books available for all languages.

Do note that I used the word "work" rather than "difficulty" in referring to the task of learning a language. The hard part is actually getting into the way of thinking necessary to use a language effectively and efficiently. The *FX commands in BBC BASIC are much more difficult than anything in Pascal, as there is no way in which the command number relates to the task, but once you know how to use them you can always look in the book to see which one to use.

Acornsoft 'C' – Release 3

Very shortly Acorn will be releasing another version of their 'C' compiler with several new features. Acorn claim that with this version of the compiler you will have everything you need to develop programs in 'C' for RISC-OS.

Release 3 contains high-level interfaces to the windowing system so that it is easy to write window-based applications with the same look and feel as !edit, !paint and !draw. (It is an interesting contrast with the American firms who are suing everyone who tries to imitate "look and feel".)

There are several key additional features:-

- Conformance with the December 1988 ANSI draft. Acorn point out that, as the draft has not yet been confirmed as a standard, it is not possible to claim conformance with any standard, nor any formal way of measuring compliance.
- RISC-OS library extensions.
- Support for developing desktop applications, relocatable modules and overlaid programs.
- Improved portability to and from RISC-OS.
- New software tools and enhanced tools that used to be part of the Software Developer's Toolbox. The Acorn Symbolic Debugger, which has been extended to include low-level debugging, is now supplied as part of the 'C' package.

There is a new procedure call standard which has been introduced to make it easier to write modules which can run in SVC mode. I presume that this will have some effect on the interaction between 'C' and Fortran referred to in issue 2.12 of Archive.

The package contains a user guide, three discs, four reference cards and a fourteen page release note which contains a good deal of useful information about the new release. It will cost £50 to upgrade from release 2 and £70 from release 1.

Pascal program parameters

Some time ago there was a request in this column for a way of dealing with more than ten parameters in the command line of a Pascal program. Ian Smith, of Smith & Wiggins who published the Pascal Graphics modules, has supplied a program which will do this. It can be used with calls such as:-

```
testtail one two 3 IV five six 7
    8 IX 10 eleven.
```

This string, including the word "testtail", will be held in the variable Command, which can be processed to get at the various values.

He points out that it works in the way expected if you are using release 1 of Pascal, but with release 2 it comes with a message at run time – 'spurious value in command tail'. I have found out that if the string, after the name of the calling program, is enclosed in quotes (") everything goes correctly again. This can be extended by using a comma as the separator between variables – and this allows the use of string parameters such as "David H Wild","Hemel Hempstead" to be passed to the program. You will, though, need to write your own routine to unpack the string.

```
{>Pas.testtail }
program testtail(output);
{ Program with PROCEDURE to read the command line
  Author I M Smith  April 11th 1989 }
const
   stringlength = 255;
type
   strings = packed array[1..stringlength] of char;
var
   command  :  strings;
procedure getcommandline (var command : strings);
const
   r0 = 0;                          { Register 0 }
   r4 = 4;                          { Register 4 }
   OS_GetEnv = 16_10;               { SWI number }
type
   stringptr = ^strings;
var
   sptr    : stringptr;
   a0,i    : integer;
begin
   a0 := address(sptr);            { sptr can hold the address of a string }
   *LDR_R4,a0;                     { Load register 4 with address of sptr  }
   *SWI_OS_GetEnv;                 { Call the SWI to read the command tail }
   *STR_R0,[R4];                   { Store the contents of R0, which is the
                                     address of the command tail string, in
                                     the location whose address is in R4. R4
                                     contains the address of sptr. SO sptr
                                     contains the address of the command
                                     tail string }
   command := sptr^;               { This copies string pointed to by sptr }
   i       := 1;                   { This finds the terminator CHR(0) }
   while command[i] <> chr(0) do
      i := i+1;
   while i < stringlength do       { Pad the rest of the string with ' ' }
      begin
         i := i+1;
         command[i] := ' ';
      end;
end;
begin
   getcommandline(command);
   writeln(command)
   { You will need to add a call to a Pascal routine here to extract the
     parameters from the command tail.  Something like GetParameter
     (Command, n), where n is an integer, will do.
     This will return a string and if numbers,
     whether INTEGER or REAL are part of the tail, then you will
     need to use conversion routines. }
end.A
```

Fact-File

(The numbers in *italic* are fax numbers.)

Acorn Computers Ltd	Fulbourn Road, Cherry Hinton, Cambridge, CB1 4JN. (0223–245200) *(–210685)*
ACE Computing	27 Victoria Road, Cambridge, CB4 3BW. (0223–322559)
Aleph One Ltd	The Old Courthouse, Bottisham, Cambridge, CB5 9BA. (0223–811679)
Apricote Studios	2 Purls Bridge Farm, Manea, Cambridgeshire, PE15 0ND. (035–478–432)
Armadillo Systems Ltd	17 Glaston Road, Uppingham, Leicester, LE15 9PX. (0572–82–2499)
Atomwide Ltd	23 The Greenway, Orpington, Kent, BR5 2AY. (0689–38852)
Beebug	Dolphin Place, Holywell Hill, St Albans, Herts, AL1 1EX. (0727–40303) *(–60263)*
Brainsoft	106 Baker Street, London, W1M 1DF. (01–486–0321 / 0836–648551) *(01–486–2111)*
Calderglen Computers	279 Keighley Road, Colne, Lancashire. (0282–866481)
CJE Micros	78 Brighton Road, Worthing, W Sussex, BN11 2EN. (0903–213361)
Clares Micro Supplies	98 Middlewich Road, Rudheath, Northwich, Cheshire, CW9 7DA. (0606–48511) *(–48512)*
Circle Software	33 Restrop View, Purton, Swindon, Wilts, SN5 9DG. (0793–770021)
Colton Software	149-151 St Neots Road, Hardwick, Cambridge, CB3 7QJ. (0954–211472) *(–211607)*
Computer Concepts	Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX. (0442–63933)
Computerware	11 Livestock Market, Hall Road, Norwich. (0603–507799)
Dabs Press	5 Victoria Lane, Whitefield, Manchester, M25 6AL. (061–766–8423) *(–8425)*
David Pilling	P.O.Box 22, Thornton Cleveleys, Blackpool, FY5 1LR.
EMR Ltd	14 Mount Close, Wickford, Essex, SS11 8HG. (0702–335747)
GMA mbH	Wandsbeker Chaussee 58, D–2000 Hamburg 76, W Germany. (010–49–40–2512415) *(010–49–40–2502660)*
Gnome Computers Ltd	16 Histon Road, Cambridge, CB4 3LE. (0223–461520)
HJH Software	16 Mold Road, Mynydd Isa, Clwyd, CH7 6TD.
Ian Copestake Software	10 Frost Drive, Wirral, L61 4XL. (051–648–6287)
Lingenuity (Lindis)	P.O.Box 10, Halesworth, Suffolk, IP19 0DX. (0986–85–476) *(–460)*
Mach Technology	29 Yarm Lane, Stockton, Cleveland, TS18 3DT. (0642–613143)
Meadow Computers	11 London Street, Whitchurch, Hants, RG28 7LH. (0256–892008)
MewSoft	11 Cressy Road, London, NW3 2NB. (01–267–2642)
Minerva Systems	69 Sidwell Street, Exeter, EX4 6PH. (0392–437756)
Mitre Software	26 Creechurch Lane, London, EC3A 5BA. (01–283–4646)
Moray Micro Computing	Enzie, Slackhead, Buckie, Moray, AB5 2BR. (05427–377)
Oak Computers	Cross Park House, Low Green, Rawdon, Leeds, LS19 6HA. (0532–502615) *(–506868)*
Protokote Ltd	(Attn Andy Burnett), Unit 5, Water Lane Trading Estate, Storrington, West Sussex, RH20 3DW. (0903–743358) *(–746325)*
Silicon Vision Ltd	Signal House, Lyon Road, Harrow, Middlesex, HA1 2AG. (01–861–2173 / 01–422–2274) *(–427–5169)*
Simtron Ltd	4 Clarence Driver, East Grinstead, W. Sussex, RH19 4RZ. (0342–328188)
Solomon Software	P.O.Box 258, Wolverhampton, WV2 3AS. (0902–28522)
TAP Consortium	34 Drake Gardens, Tavistock, Devon, PL19 9AT. (0822–613868)
Techsoft UK Ltd	Old School Lane, Erryrs, Mold, Clwyd, CH7 4DA. (082–43318)
Topologika	P.O. Box 39, Stilton, Peterborough, PE7 3RL. (0733–244682)
Video Electronics Ltd	Wigan Road, Atherton, Manchester, M29 0RH. (0942–882332)
VisionSix Ltd	13 Paddock Wood, Prudhoe, Northumberland, NE42 5BJ. (0661–33017) *(–36163)*
Watford Electronics	250 Lower High Street, Watford, WD1 2AN. (0923–37774) *(01–950–8989)*
Wild Vision	6 Jesmond Road, Newcastle upon Tyne, NE2 4PQ. (091–281–8481

Norwich Computer Services 18 Mile End Road, Norwich, NR4 7QY. (0603-507057) (Fax 250095)